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Norms, Military Utility, and the Use/Non-use of Weapons: The Case of Anti-Plant and Irritant
Agents in the Vietnam War

Dr Susan B Martin
Department of War Studies
King's College London
The Strand
London WC2R 2LS UK
susan.b.martin@kcl.ac.uk

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Abstract:

The role of norms and military utility in the use of weapons is disputed by constructivist and realist scholars. Through an examination of US decision-making regarding anti-plant and irritant agents in the Vietnam War, I advance this debate in three key ways: First, I develop structural realism's expectations regarding the role of military utility. Second, I demonstrate that social and material factors are at play in our understandings of both 'norms' and 'military utility', and that both played a role in US decisions. Third, I find that the dominant role—as structural realism expects—was played by military utility.

Key Words: structural realism, norms, chemical weapons, taboo, non-lethal weapons

Realist and constructivist scholars have long disputed the role of norms and military utility in the use and non-use of weapons. Here I revisit the debate and examine the influence of norms and utility on US decisions regarding the use of anti-plant and irritant agents in the Vietnam War. I find that while norms concerning chemical weapons, legality, and discrimination in war all played a role in US policy, the overriding factor in US decision-making was military effectiveness and in particular the usefulness of these agents in accomplishing US goals in Vietnam. This finding corresponds to the expectations of structural realism.¹

According to realists, the anarchic nature of the international system encourages states to prioritise survival and security, particularly in times of war; thus the use or non-use of a weapon should be strongly influenced by considerations of military utility. In contrast, constructivist scholars such as Richard Price and Nina Tannenwald argue that state policy makers are also constrained by norms, and that in particular, the norms surrounding chemical, biological, and nuclear weapons play an important role in making these weapons unusable.² The contribution that Tannenwald, Price and others have made is to show that norms exist and matter even in the 'hard security' realm that has been the 'home turf' of realist theories.³

While the importance of both norms and military utility in international politics is now clear, there is still work to do on how they matter—what role these factors play. In addition, the work on norms and weapons has highlighted the fact that there is no fully developed realist account of what determines the role of particular weapons in international politics. Realists have assumed, rather than demonstrated, that military utility and consequentialist reasoning dominate decisions regarding the use of weapons. This article addresses these gaps.

In addition, my analysis of the role of norms and military utility supports the work of other scholars who argue that the international system constrains states to base decisions on expected consequences as opposed to norms.⁴ For example, Stephen Krasner argues

¹ Kenneth N Waltz, *Theory of International Politics* (NY: Random House, 1979).

² Richard M Price, *The Chemical Weapons Taboo* (Ithaca: Cornell UP, 1997); Richard Price, 'Reversing the Gun Sights: 'Transnational Civil Society Targets Land Mines', *International Organization* 52/3 (1998), 613-44; Nina Tannenwald, *The Nuclear Taboo: The United States and the Non-Use of Nuclear Weapons Since 1945* (Cambridge: Cambridge UP, 2007).

³ See also Matthew Evangelista and Henry Shue, eds., *The American Way of Bombing* (Ithaca: Cornell UP, 2014); Peter J Katzenstein, ed., *The Culture of National Security* (NY: Columbia UP, 1996); Jeffrey W Legro, *Cooperation under Fire: Anglo-German Restraint during World War II* (Ithaca: Cornell UP, 1995); TV Paul, *The Tradition of Non-use of Nuclear Weapons* (Stanford, CA: Stanford UP, 2009).

⁴ Stephen D Krasner, *Sovereignty: Organized Hypocrisy* (Princeton: Princeton UP, 1999); see also Benjamin Valentino, Paul Huth and Sarah Croco, 'Covenants without the Sword: International Law and the Protection of Civilians in Times of War', *World Politics*, 58/3 (April 2006), 339-377; Alexander B Downes, *Targeting Civilians in War* (Ithaca: Cornell UP, 2008).

that 'stronger states can pick and choose among different rules selecting the one that best suits their instrumental objectives', and American policy makers did just that in this case, justifying the use of irritant agents in Vietnam by arguing that they were more humane when civilians were intermixed with combatants.⁵

Because both norms and military utility were important, one can tell the story of the use and non-use of CBN in Vietnam in at least two ways. The first highlights the importance of norms: Throughout the Vietnam War, the US recognised the use of lethal chemical and biological agents as wrong. Although it had not signed the 1925 Geneva Protocol, which banned the first use of chemical and biological weapons, American policymakers did not base the legality of American use of anti-plant and irritant agents in Vietnam on its non-signatory status. Instead, it claimed that its use of anti-plant and irritant agents fell outside the Geneva Protocol, which it recognised as part of customary international law. Thus, US decision makers argued that the US abided by the norms governing CB weapons, and in retrospect, we can see that debates over the US position contributed to a strengthening of the norm against CBW use. Similarly, Tannenwald argues that the US recognised an emerging taboo on nuclear use during the Vietnam War and that its decision not to use nuclear weapons contributed to the further development of that taboo.⁶

The second version emphasizes the role of military utility and the consequentialist logic that drove US decisions about use. US decision makers evaluated the consequences of use, weighing military utility against political costs. They concluded that anti-plant and irritant agents had utility that outweighed the political costs, and used them accordingly. In contrast, they did not use biological, lethal chemical, and nuclear weapons, because they lacked military utility within the strategic context of Vietnam.

I argue that both versions are correct. Both norms and military utility were active factors in US decision-making. Ultimately, however, the evidence suggests that a consequentialist logic and concerns about military utility were determinative in decisions regarding use; the central focus of decision-making was on the extent to which the use of these weapons would aid or impede the attainment of US goals. Policy-makers treated normative concerns as political costs and factored them into consequentialist reasoning. However, it is also clear that norms played an independent role in the decision-making process. For example, decision makers did see CBN weapons as 'different' from ordinary weapons and argued that decisions about their use required at least some top decision maker consideration.

⁵ Krasner, *Sovereignty*, 6.

⁶ Nina Tannenwald, 'Nuclear Weapons and the Vietnam War', *Journal of Strategic Studies*, 29/4 (August 2006), 675-722; see also Tannenwald, *Nuclear Taboo*.

This case also demonstrates that social and material factors are at play in both 'norms' and 'military effectiveness'. For example, as I show below, people both within and without the Kennedy Administration reached different judgements about the military utility of anti-plant agents. This continued even when there was data from the actual use of these agents in Vietnam. However, this did not have much impact on policy. US policy makers largely treated technology as a given and military (in)effectiveness as inherent in that technology (or at least in given applications of that technology). In addition, the evidence here suggests that once approval has been given for the use of a weapon, it is difficult to halt that use, at least within the context of an on-going conflict where there is pressure to use any tool available to accomplish one's goals. This emphasis on the possible military contribution made by a weapon, as opposed to its other attributes, accords with realism's expectations.

The Vietnam War is an appropriate case study because the US had chemical and biological agents as well as nuclear weapons available for use. While details of the US CBN arsenal are difficult to obtain, the existence of US strategic and tactical nuclear weapons is well known.⁷ In terms of chemical weapons, the Centre for Disease Control reports that by 1968 the US had stockpiled close to 40,000 tons of chemical warfare agents.⁸ In terms of biological weapons, David Franz reports that by 1951 the US was producing an anticrop biological weapon and that by the mid-1950s it was producing various agents for antipersonnel biological cluster bombs.⁹

Critics might suggest that this is an 'easy' case for realism because it concerns decision-making during war and because the US used both anti-plant and irritant weapons.¹⁰ However, the case provides an important window into decision-making on the use of particular weapons: The use of each type of agent evolves in a different way, providing two different ways that use comes about. In addition, the decision to use of anti-plant agents was

⁷ See William Burr, ed., 'How Many and Where Were the Nukes?: What the US Government No Longer Wants You to Know about Nuclear Weapons during the Cold War', National Security Archive Electronic Briefing Book No. 197, posted 18 August 2006, available at : <http://nsarchive.gwu.edu/NSAEBB/NSAEBB197/> (accessed 8 October 2015).

⁸ Center for Disease Control and Prevention, 'History of US Weapons Elimination', available at: <http://www.cdc.gov/nceh/demil/history.htm> downloaded 11 March 2015.

⁹ David R Franz, Cheryl D Parrott, and Ernest T Takafuji, 'The US Biological Warfare and Biological Defense Programs' in *Medical Aspects of Chemical and Biological Warfare* eds. Frederick R Sidell, Ernest T Takafuji and David R Franz (Washington, DC: Office of the Surgeon General at TMM Publications, Borden Institute, Walter Reed Army Medical Center, 1997), available at: <http://www.cs.amedd.army.mil/borden/Portlet.aspx?ID=bddf382f-3ca0-44ba-bd67-fdc48bfa03de>. However, it is also true that the US military had not fully assimilated biological weapons and that American preparedness for biological warfare was judged unsatisfactory. See John Ellis van Courtland Moon, 'The US Biological Weapons Program' in *Deadly Cultures: Biological Weapons Since 1945* eds. Mark Wheelis, Lajos Rozsa and Malcom Dando (Cambridge: Harvard UP, 2006), 9-46.

¹⁰ Note that the larger project of which this work is a part also examines the non-use of nuclear, biological and lethal chemical weapons during the Vietnam War.

controversial, and there were intense discussions about whether such use made sense. Given the extent to which some of the constructivist accounts have discounted military utility, it is important to make the realist case. The extensive debates about the use of anti-plant agents provide an opportunity to do so.

The arguments that follow depend largely on an examination of US government decision-making through the available documentary record. I also examine media accounts, including *New York Times* coverage, memoirs of various office holders, and secondary sources. The reliance on government documents could be problematic, because policy briefs and government memorandum are likely to use the language of military strategy and consequentialist reasoning, regardless of the ‘true’ motivation behind a policy. However, an example from the Eisenhower Administration shows that there is room to make appropriateness arguments within government circles: The 1958 Basic National Security Policy declared the use of preventive war to reduce Soviet or Chinese communist military power to be ‘unacceptable’ to the United States and its allies, and ruled it out of bounds on those grounds.¹¹

The argument has three steps. First, I draw on March and Olson’s distinction between consequentialist and appropriateness reasoning to investigate the logic of decisions revealed in the documentary record.¹² I find that the logic of anticipated consequences dominates the logic of appropriateness; norms entered into consequentialist arguments by creating political costs, but decision makers consistently argued that if a weapon had military utility it should be used. Second, I develop structural-realist expectations regarding systemic constraints on the use of weapons, and I analyse the role played by three types of military utility—technical, tactical, and strategic—in decisions on the use of anti-plant and irritant agents. Third, I examine the role of normative factors, including the ‘taboo’ nature of chemical weapons, legal restrictions, and the broader laws of war. In the conclusion, I summarise the main arguments and identify avenues for further research. Before turning to the main arguments, I situate the Vietnam War within broader American policy and summarise US decisions regarding anti-plant and irritant agents to provide context for the analysis that follows.

The Vietnam War

¹¹ *Foreign Relations of the United States [FRUS]*, 1958-1960, Vol. III, National Security Policy; Arms Control and Disarmament, eds. Edward C Keefer and David W Mabon (Washington: Government Printing Office, 1996), Doc. 24, ‘Statement of Basic National Security Policy’, National Security Council Report, 5 May 1958. In retrospect, it is also striking how easily American policy-makers brushed this norm aside in the 2003 War in Iraq.

¹² James P March and Johan P Olsen, ‘The Institutional Dynamics of International Political Orders’, *International Organization* 52/4 (September 1998), 949-954.

In order to understand US decisions regarding the use of anti-plant and irritant weapons in the Vietnam War, it is necessary to understand four characteristics of the war. First, the United States was not directly threatened by North Vietnam or by the extension of the North Vietnamese regime to South Vietnam. There was no prospect of an attack on the United States, no vital interests such as raw materials or sea lanes to which the US would lose access. The threat in Vietnam was indirect. The Vietnam War was important for the United States only to the extent that it was part of the on-going struggle with the USSR, as part of the Cold War and the conflict between Capitalism and Communism. Yet in the 1960s, this made Vietnam very important indeed. American decision makers generally believed that what was at stake for the US was the credibility of its commitment to defend non-Communist states, and they worried that the loss of South Vietnam would be one in a series of dominoes leading to Communist control of Southeast Asia and beyond. Thus in a 1961 memo, Secretaries Rusk and McNamara argue that

The loss of South Vietnam to Communism would involve the transfer of a nation of 20 million people from the free world to the Communist bloc. The loss of South Vietnam would make pointless any further discussion about the importance of Southeast Asia to the free world; we would have to face the near certainty that the remainder of Southeast Asia and Indonesia would move to a complete accommodation with Communism if not formal incorporation within the Communist bloc....[That in turn] would not only destroy SEATO but would undermine the credibility of American commitments elsewhere.¹³

For the Kennedy and later the Johnson administrations, what was at issue was not just Southeast Asia but the credibility and maintenance of US commitments everywhere.¹⁴

Second, the fact that the threat in Vietnam was indirect meant that the United States had an interest in ensuring that the war did not expand into a direct threat to American security. While decision makers evaluated military options in terms of their effectiveness in Vietnam, they also considered their effect on the overall strategic situation of the United States: How would Communist China respond? Would the Soviets react by supplying arms to North Vietnam or by getting up to further mischief in Berlin? What would be the impact on

¹³ *Pentagon Papers [United States –Vietnam Relations, 1945-1967]*, IV.B.1, Evolution of the War Counterinsurgency: The Kennedy Commitments, 1961-1963. The Kennedy Commitments and Programs, National Archives Identifier: 5890493, 'Memorandum for the President, Subject: South Vietnam' (11 Nov. 1961) from Office of the Secretary of Defense, Vietnam Task Force, 125-126, available at: <https://www.archives.gov/research/pentagon-papers/> (accessed 14 October 2015).

¹⁴ The role of Vietnam in domestic politics is also noteworthy. In the early 1960s, as argued by Robert Dean, this centred on the likely political consequences of a 'loss' of Vietnam. See Robert D Dean, *Imperial Brotherhood: Gender and the Making of Cold War Foreign Policy* (Amherst: University of Massachusetts Press, 2001), esp. Chapter 8, 201-240. Later, as the escalation of US efforts continually failed to achieve US aims and as public opinion turned increasingly against the war, the domestic costs of the loss of Vietnam were less than the costs of continuing to fight.

what McGeorge Bundy later refers to as 'nuclear danger'?¹⁵ US decision makers were clear that they did not want to take moves that would prompt Chinese or Soviet intervention in Vietnam or Soviet counter-moves in Europe. The US did not want to engage in a land war with China or start moving up an escalation ladder to nuclear war. The Cuban Missile Crisis had made 'nuclear danger' clear for all to see, and while the US was engaged in Vietnam, it was also working on a variety of initiatives to lessen the danger of nuclear war. These would culminate in the 1963 Hot Line Agreement, the Limited Test Ban Treaty of 1963, and the Nuclear Nonproliferation Treaty of 1968. As cooperation with the Soviet Union was essential for the success of these efforts to lessen the dangers posed by nuclear weapons, the US had to worry about repercussions of its actions in Vietnam on this aspect of US-Soviet relations as well.

Thus, the Vietnam War was a war fought within limits. These limits included the non-use of biological, nuclear and lethal chemical weapons as well as a variety of limits on the use of air power, ground forces, and the geographical scope of US actions. The US government also drew the line at an expansion of war aims that would have involved regime change in North Vietnam, as they worried that this would prompt Chinese intervention and a strong Soviet reaction. However, it was not clear if the US could achieve its objectives within those limits, and policymakers at the time wrangled with the tension between limited means and unlimited ends.¹⁶ Ultimately, the US strategy was one of coercing the North Vietnamese to accept an independent, Western-oriented South Vietnam; it aimed to impose enough costs on the North Vietnamese that they would be willing to compromise.

Third, US decision makers saw Vietnam as a new kind of war that required new ways of fighting. In a 1962 speech at West Point, Kennedy explained:

This is another type of war, new in its intensity, ancient in its origin--war by guerrillas, subversives, insurgents, assassins, war by ambush instead of by combat; by infiltration, instead of aggression, seeking victory by eroding and exhausting the enemy instead of engaging him....It requires...a whole new kind of strategy, a wholly different kind of force, and therefore a new and wholly different kind of military training.¹⁷

In this new kind of war, it was difficult to draw a clear distinction between combatants and non-combatants. In addition, the battle was in a large part a battle for the allegiance of the

¹⁵ McGeorge Bundy, *Danger and Survival: Choices about the Bomb in the First Fifty Years* (New York: Random House, 1988).

¹⁶ *Pentagon Papers [United States –Vietnam Relations, 1945-1967]*, IV.C.1 US Programs in South Vietnam, Nov. 1963-Apr. 1965; NSAM 273-NSAM 288- Honolulu, National Archives Identifier 5890498, 'Summary and Analysis', from Office of the Secretary of Defense, Vietnam Task Force, i-vii, available at: <https://www.archives.gov/research/pentagon-papers/> (accessed 14 October 2015).

¹⁷ John F Kennedy, 'Remarks at West Point to the Graduating Class of the US Military Academy', 6 June 1962, available at: <http://www.presidency.ucsb.edu/ws/?pid=8695> (accessed 18 March 2015).

people, which created a concern with the impact of particular weapons on ‘hearts and minds’ in Vietnam (in addition to American domestic and international public opinion).

It also led in part to the fourth characteristic of the war, which was the US interest in exploring new technologies, both to increase US capabilities for this new type of war and to avoid sending (more and more) US combat forces.¹⁸

Overview of Decisions Regarding Anti-Plant and Irritant Agents

In this section, I sketch the sequence and timing of US decisions regarding the use of anti-plant and irritant agents in order to lay a foundation for the analysis of military utility and norms that follows.

The key decision-making on the use of anti-plant agents took place during the Kennedy administration. While Kennedy eventually granted approval for the use of anti-plant agents for both defoliation and crop destruction, approval for the latter lagged that of the former because Kennedy and his advisors saw food denial operations as more controversial. Despite this difference in timing, the pattern of approval was similar for both: first limited trials, then operational missions each of which required approval by decision makers in Washington, followed by the delegation of authority for approval of these missions to the American Ambassador and the US Military Commander in Vietnam.

More specifically, American policy makers discussed anti-plant agents as early as 1961, as part of the effort to bring new technologies to bear in Vietnam, and later that same year anti-plant agents were tested for efficacy in the Vietnamese ecosystem.¹⁹ In November 1961, the possible use of anti-plant agents went to President Kennedy for a decision. In his decision that same month, Kennedy distinguishes between defoliation and crop destruction, approving only a limited trial for the former, to gather data on both their tactical effectiveness and the political costs of use. NSAM 115 specifies that ‘there should be careful prior consideration and authorization by Washington of any plans developed by CINCPAC and the country team under this authority before any such plans are executed’.²⁰ A year later, in

¹⁸ See Eveyln Frances Krache Morris, *Into the Wind: The Kennedy Administration and the Use of Herbicides in South Vietnam*, PhD Dissertation, Georgetown University, 2012, 34.

¹⁹ Lt. Gen. John H Hay Jr, *Tactical and Materiel Innovations* (Washington, DC: Department of the Army, 1974), 89-90. General work on military applications for anti-plant agents began earlier; Lewy notes that that US defoliant tests began in 1958-59. See Guenter Lewy, *America in Vietnam* (Oxford: Oxford UP, 1978), 257.

²⁰ See Papers of John F Kennedy, Presidential Papers, National Security Files, Meetings and Memoranda. National Security Action Memoranda [NSAM]: NSAM 115, John F Kennedy Presidential Library and Museum, ‘National Security Action Memorandum Number 115: Defoliant Operations in Viet-NAM’, 30 Nov. 1961. JFKNSF-332-017, available at: <http://www.jfklibrary.org/Asset-Viewer/Z8-vBiaBdEW2Cz9g6NUB7g.aspx> (downloaded 14 May 2014). Note that the ‘country team’ meant the American Ambassador and the United States military commander in Vietnam; the latter would have been the head of the Military Assistance Advisory Group Vietnam (MAAGV) or the head of the Military Assistance Command, Vietnam (MACV). MACV was established on 8 February 1962.

November 1962, Kennedy delegates the authority to approve specific defoliation operations to Saigon. Trial crop destruction operations received Presidential approval in October 1962.²¹ At first, crop destruction operations required authorisation from Washington, although as with defoliation operations this is eventually delegated to Saigon in 1964.²²

Once the President delegated approval authority for anti-plant operations to Saigon, the use of these agents generally expands and retracts in line with the overall American effort in Vietnam.²³ The use of anti-plant agents reached a peak in 1968 and then decreased with the US draw down.²⁴ Other factors also contributed to the decline in use of anti-plant agents, including a request from South Vietnamese President Thieu that defoliation operations be limited to remote areas and increasing public opposition to the war overall and to the use of herbicides.²⁵ One of the most important causes of the decline in use

²¹ Charles V Collins, 'Herbicide Operations in Southeast Asia', Project CHECO Report, AD-779 776 (San Francisco: Department of the Air Force, Headquarters Pacific Air Forces, 11 October 1967), 29-31, available at: www.dtic.mil/get-tr-doc/pdf?AD=AD0779796 (downloaded 3 March 2015); 9.

²² Collins, 'Herbicide Operations', 11. Buckingham reports that before October 1964, the Vietnamese Air Force carried out all crop destruction operations; the first missions involving US planes took place on 3 October 1964. The American planes carried South Vietnamese markings and were 'ostensibly under the control of a South Vietnamese "aircraft commander."' See William A Buckingham, Jr., *Operation Ranch Hand: The Air Force and Herbicides in Southeast Asia, 1961-1971* (Washington, DC: Office of Air Force History, United States Air Force, 1982), 104-105.

²³ See Jeanne Mager Stellman, Steven D Stellman, Richard Christian, Tracy Weber and Carrie Tomasallo, 'The Extent and Patterns of Usage of Agent Orange and Other Herbicides in Vietnam', *Nature* 422 (17 April 2003), 'Figure 5, Time course of herbicide sorties from 1961-1971', page 685; Institute of Medicine, [Committee to Review the Health Effects in Vietnam of Exposure to Herbicides], *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam* (Washington DC: National Academies Press, 1994), 'Table 3-1, Summary of US Military Strength in Vietnam and Quantities of Herbicide Sprayed (million gallons): 1960-1973', 77. In Table 3-1, the figures provided for the quantity of herbicides do not reflect the corrections made by Stellman et al., 'Extent and Patterns of Usage'. For the data on quantity of herbicides, see National Research Council (NRC), [Committee on the Effects of Herbicides in Vietnam, Division of Biological Sciences, Assembly of Life Sciences], *The Effects of Herbicides in South Vietnam, Part A—Summary and Conclusions* (Washington, DC: National Academy of Sciences, 1974), Table 1, 'Application of Herbicides in the Vietnam War by Year', page S-1. Note that geographic expansion also occurred; on use in Laos, see Stellman et al., 'Extent and Patterns of Usage', 685-6.

²⁴ See Buckingham, *Operation Ranch Hand*, 160 on the pressure to cut back anti-plant operations as the Nixon administration undertakes its policy of Vietnamization.

²⁵ See Buckingham, *Operation Ranch Hand*, 161-171; Paul Frederick Cecil, *Herbicide Warfare: The RANCH HAND Project in Vietnam* (NY: Praeger, 1986), 150. As Stellman et al. note, the use of anti-plant agents were 'a matter of scientific controversy from their inception' ('Extent and pattern of Usage', 681). This scientific opposition to the use of anti-plant agents played a key role in constraining policymakers to examine and re-examine the costs and benefits of anti-plant agents. The Institute of Medicine dates 'public concern over the use of herbicides in Vietnam' to 1964, citing Young and Reggiani on a statement published by the Federation of American Scientists (*Veterans and Agent Orange* 1994, 29); see also AL Young and GM Reggiani, *Agent Orange and its Associated Dioxin: Assessment of a Controversy* (NY: Elsevier 1988). However, the FAS statement focuses largely on lethal chemical and biological agents and does not specifically address anti-plant agents. See 'FAS Statement on Biological and Chemical Warfare', *Bulletin of Atomic Scientists* 20/8 (1964), 46-47. I have been unable to find much evidence of concern on the part of the general public over the use of herbicides until after the 1969 release of the Bionetics report that showed 2,4,5-T was potentially harmful. See Bionetics Research Laboratories, *Evaluation of Carcinogenic, Teratogenic and Mutagenic Activities of Selected Pesticides and Industrial Chemicals*, Vols. I-III, NTIS PB223 161 (Bethesda, MD: Bionetics Research Labs, 1968), available at

was the 1969 publication of the finding that Agent Orange posed a danger to human health.²⁶ At that point, in October 1969, the DOD restricted the use of Agent Orange to areas remote from populations. In April 1970, the use of Agent Orange was suspended completely, and the last fixed wing defoliation mission was flown in May. Crop destruction operations continued for another few months, but in December, the White House announced an 'orderly yet rapid phase out of the herbicide program'.²⁷ Estimates of the total amount of herbicide and the total amount of land sprayed in Vietnam have varied. Based on records of Air Force spray missions, Stellman et al. estimate that from 1961-1971, almost 77 million litres of herbicides were sprayed from aircraft over 2,631,297 hectares.²⁸

The use of irritant agents unfolded differently. The key period of top policy-maker involvement was in the Johnson Administration, particularly from 1965-1966. Several earlier events helped pave the way for use: First, the French left behind some irritant agents when they withdrew from Indochina in 1956.²⁹ Second, US policy on the use of irritant agents changed in 1960. For the first time, the Basic National Security Policy distinguished between irritant agents and other chemical weapons, and declared that Presidential authorisation was not required for the use of irritant agents.³⁰ Third, the US began routine issuing of irritant

<http://www.nal.usda.gov/exhibits/speccoll/items/show/4099> (downloaded 20 October 2015). Dow Chemical, which produced both Agent Orange and napalm, was a key target of protests, but news coverage suggests that napalm and not Agent Orange was the focus. For more on the controversy over the use of herbicides, see Institute of Medicine, *Veterans and Agent Orange*, 1994, esp. Chapter 2, 23-73; David Zierler, *The Invention of Ecocide: Agent Orange, Vietnam, and the Scientists Who Changed the Way We Think about the Environment* (Athens: University of Georgia Press, 2011); GM Reggiani, 'Historical Overview of the Controversy Surrounding Agent Orange' in *Agent Orange and its Associated Dioxin: Assessment of a Controversy* eds. AL Young and GM Reggiani (New York: Elsevier, 1988), 31-76.

²⁶ Bionetics Research Laboratories, *Evaluation of Carcinogenic, Teratogenic and Mutagenic Activities*.

²⁷ Cecil, *Herbicidal Warfare*, 152.

²⁸ See Stellman et al., 'Extent and Pattern of Usage', esp. Table 1, 'Use of Military Herbicides in Vietnam (1961-1971)', 682 and Table 2, 'Estimated Area and Frequency of Spraying', 685; see also Institute of Medicine, Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides (Ninth Biennial Update). *Veterans and Agent Orange: Update 2012* (National Academies Press, 2014), Table 3-1, 'Military Use of Herbicides in Vietnam (1961-1971)', 5; see also NRC, *Effects of Herbicides*. Note other branches of the US military also used anti-plant agents, though Stellman et al. estimate that this amounted to less than 5% of the total amount of agent used. See Stellman et al. 681-2. Australian forces also used anti-plant agents in Vietnam.

²⁹ 'Excerpts from 'Transcript of Rusk News Parley on Use of Gas in Vietnam', *New York Times*, 25 March 1965.

³⁰ The Eisenhower Administration amended 1959 Basic National Security Policy on 24 August 1960. See *FRUS, 1958-1960*, Volume III, Doc. 114. The original policy was that 'the United States will be prepared to use chemical and biological weapons to the extent that such use will enhance the military effectiveness of the armed forces. The decision as to their use will be made by the President'. See *FRUS, 1958-1960*, Volume III, Doc. 70, 'NSC 5906/1', 5 Aug. 1959. Preliminary research suggests that the amendment was motivated in part by concern about the ability of the US to fight a limited war without the use of nuclear weapons. Note also that in February 1962, Dr Herbert York (Director of Research and Engineering for the Department of Defense) and General Lyman Lemnitzer (Army Chief of Staff) briefed the National Security Council on 'technological developments in non-lethal weaponry [including tear gas] and military doctrine for possible use'. See *FRUS 1958-1960*, Volume III, Doc. 92.

agents to some US troops and allies; with State Department approval, South Vietnam began to receive US irritant agents in 1962.³¹ Finally, as discussed below, the US military wanted to explore the potential of these agents, including for the conflict in Vietnam, and as part of this exploration the US Army carried out a full-scale troop test of CS in Operation Water Bucket at Fort Campbell, KY in June 1963.³²

The first use of irritant agents in South Vietnam was for domestic riot-control purposes, during the Buddhist Crisis in 1963.³³ South Vietnamese troops again used irritant agents against rioters in November 1964. In the meantime, in early 1964, MACV examined the potential for riot control and incapacitating agents in RVN Counterinsurgency operations; MACV then requested 'authority for the tactical employment of these munitions'.³⁴ In response to a CINCPAC request, plans 'for the use of CS gas on both wide-spread and limited scale' were submitted by COMUSMACV, 'with recommendations that the initial use of CS gas be conducted by the Vietnamese, for RVNAF already possessed the capability to initiate such use and therefore heavy US involvement would not be necessary'.³⁵ The first use in combat came in late 1964, in operations that aimed to rescue American POWs.³⁶ According to Hay, in February 1965 Westmoreland told those under his command that

³¹ Secretary of State Rusk 'made it clear that the State Department approved the original shipments of the gases in 1962'. See John Finney, 'Rusk Defends Use of Nonlethal Gas in War in Vietnam', *New York Times*, 25 March 1965. Note that there is some disagreement in the secondary literature about the type of agents that were issued; Lewy states that the US supplied CS, CN and DM, while Hersh argues that DM was not supplied until 1964. See Lewy, *America in Vietnam*, 248; Seymour Hersh, *Chemical and Biological Warfare: America's Hidden Arsenal* (NY: The Bobbs-Merrill Company, 1968), 167-168. For a description of these different irritant agents, see Michael Crowley, *Chemical Control: Regulation of Incapacitating Chemical Agent Weapons, Riot Control Agents and their Means of Delivery* (NY: Palgrave Macmillan, 2016), 39-44.

³² On Operation Water Bucket, see Sherman L. Davis, 'Riot Control Weapons for the Vietnam War', Historical Monograph AMC 56M (Maryland: Edgewood Arsenal, June 1970), 4. I thank Reid Kirby for providing me with a copy of this.

³³ This incident came to the attention of top policy makers because of the possible use of mustard gas. See *FRUS*, 1961-1963, Vol. III, Vietnam, January-August 1963, eds. Edward C Keefer and Louis J Smith (Washington, DC: US Government Printing Office, 1991), Docs. 146-149 and 151; see also D. Hank Ellison, *Chemical Warfare during the Vietnam War: Riot Control Agents in Combat* (New York: Routledge, 2011), 9-11.

³⁴ History Branch, Office of the Secretary, Joint Staff, Command History, *United States Military Assistance Command Vietnam [US MACV], 1964* (San Francisco, CA: 1965), 95, available at: <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA955106&Location=U2&doc=GetTRDoc.pdf> (accessed 6 May 2015).

³⁵ History Branch, Office of the Secretary, Joint Staff, *Command History, US MACV 1964*, 95-96.

³⁶ For the details of these first uses, see Military History Branch, Office of the Secretary, Joint Staff, HQ MACV, *Command History: US MACV 1965* (SF: US MACV, 1966); Ellison, *Chemical Warfare*, 11-14; Military Assistance Advisory Group, 'Lessons Learned Number 51: Operational Employment of Riot Control Munitions', 24 April 1965, available from the Combined Arms Research Library, Digital Library, at <http://server16040.contentdm.oclc.org/u?/p4013coll11,1488> (downloaded 10 June 2014); see also General Westmoreland's report on these first uses of irritant agents in 'Riot Control Munitions', 23 March 1965, available at Riot Control Munitions, 23 March 1965, Folder 11, Box 08, George J. Veith Collection, The Vietnam Center and Archive, Texas Tech University, accessed 12 May 2015, <<http://www.vietnam.ttu.edu/virtualarchive/items.php?item=3670811036>>.

irritant agents could be used for self-defence.³⁷ In March 1965, Peter Arnet's story on the American use of irritant agents sparked both domestic and international protest. This led to a temporary pause in use, as the Johnson Administration scrambled to respond to the barrage of criticism. In September 1965, Lt. Col. Leon Utter made unauthorised use of irritant agent in a situation where civilians were intermingled with combatants. The media emphasized the 'humanitarian' use of irritant agents in this case, and the political mood changed.³⁸ Westmoreland gained permission to use irritant agents in one specific mission on 8 October, and in November, the Department of Defense affirmed his overall authority to use these agents.³⁹ In December, Westmoreland issued instructions that permitted 'unrestricted use of CS and CN at the discretion of the senior commander concerned'.⁴⁰

As the war expanded so did the use of irritant agents. Irritant agents were publicly justified as the more humane option when civilians were intermingled with combatants, but they were used in a wide variety of tactical situations, including to clear and render uninhabitable a variety of fortifications (including tunnels and caves), to help clear landing areas for helicopters, and in urban combat, particularly in Hue.⁴¹ US forces also used these agents in conjunction with—and to maximise the lethality of—conventional weapons.⁴² Lewy reports that 'between fiscal year 1965 and fiscal year 1969, procurement of CS for Southeast Asia underwent a 24-fold increase' and that 'by 30 June 1969, some 13.7 million pounds of

³⁷ Hay, *Tactical and Materiel Innovations*, 34.

³⁸ Two editorials in the *New York Times* illustrate the change in opinion: 'Gas (nonlethal) in Vietnam', published on 24 March 1965, argues that 'gas is a wretched means to achieve even the most valid ends'. In contrast, the 11 September 1965 editorial, 'Using Tear Gas in Vietnam', argues that 'nonlethal riot-control gases can be far more humane and will cause far fewer casualties than many of the weapons now being used in Vietnam'. In supporting General Westmoreland's request for a reaffirmation of authority to use irritant agents in Vietnam, Bundy notes that 'even the *New York Times* is resoundingly with us on this'. See *FRUS*, 1964-1968, Vol. III, Vietnam, June-December 1965, eds. David C Humphrey, Edward C Keefer and Louis J Smith (Washington, DC: US Government Printing Office, 1996), Doc. 150, 'Memorandum from the President's Special Assistant for National Security Affairs (Bundy) to President Johnson', 23 Sept. 1965.

³⁹ See Hay, *Tactical and Materiel Innovation*, 36. For General Westmoreland's recollections, see William C Westmoreland, *A Soldier Reports* (New York: De Cap Press, 1989), 278-279. Davis makes a distinction between defensive and offensive use. He states, 'Before the fall of 1965 CS was not authorised for battlefield use in Vietnam by the theatre command, although American personnel had been authorized protective masks and CS grenades for use in self-defense'. See Davis, 'Riot Control Weapons', 10.

⁴⁰ Military History Branch, *Command History MACV 1965*, 444.

⁴¹ Hay, *Tactical and Materiel Innovation*; Ellison, *Chemical Warfare*; 'Combat Operations After Action Report (Operation Hue City)' 20 March 1968, available at the Combined Arms Research Library Digital Library at <http://cgsc.contentdm.oclc.org/cdm/ref/collection/p4013coll11/id/1403> (accessed 1 April 2016).

⁴² See 'US Explains New Tactic', *New York Times*, 22 February 1966, accessed through ProQuest Historical Newspapers.

CS had been used'.⁴³ The US continued to use irritant agents until it withdrew its forces from Vietnam.⁴⁴

Consequentialist versus Appropriateness Logics

As part of their disagreement about the influence of military utility and norms, realists and constructivists disagree about the relative importance of two different logics of decision-making. In examining the role played by military utility and norms, we therefore need to look first at the logic of decisions and then at whether and how policy-makers incorporated military utility and norms into that logic.

As developed by March and Olson, the logic of anticipated consequences is largely based on the costs and benefits of a proposed course of action, while the logic of appropriateness is largely based on an understanding of the 'rightness' or 'wrongness' of an action, on the appropriateness of the action for the identity of the actor involved.⁴⁵

Tannenwald connects the logic of consequences with a materialist explanation in her work on the nuclear taboo, arguing that

a purely materialist explanation would expect to see decision-making about nuclear use reflect cost-benefit type thinking in terms of 'non-norms' factors such as fear of escalation, global war, or long-term retaliation, the military utility of nuclear weapons, weapons availability, the costs and feasibility of nuclear weapons and their alternatives, or the long-term military consequences of using nuclear weapons. Decision-making...would evaluate the nuclear option in terms of consequences for US military interests, not in terms of whether it was inherently 'right' or 'wrong'.⁴⁶

US decision-making on the use of anti-plant and irritant agents in the Vietnam War was dominated by this kind of concern with consequences; norms worked instrumentally, by raising the (potential) costs associated with the use of anti-plant and irritant agents.

Discussions focused on technical and tactical effectiveness in Vietnam and the impact of use on overall US strategic aims; policy makers then weighed military utility against political costs. US decision makers constantly asserted that if the benefits of use outweighed the costs, then the weapons should be used. As will be discussed in more detail below, they

⁴³ Lewy, *America in Vietnam*, 250.

⁴⁴ By April of 1970, the use of these agents was reportedly decreasing. See Stockholm International Peace Research Institute (SIPRI), *The Rise of CB Weapons*, Vol. 1 of *The Problem of Chemical and Biological Warfare* (New York: Humanities Press 1971), 191.

⁴⁵ See March and Olsen, 'Institutional Dynamics'. As they note on p. 954, these logics are not exclusionary. Martha Finnemore and Kathryn Sikkink suggest that the appropriateness logic may become more prominent over the life-cycle of a norm. See Martha Finnemore and Kathryn Sikkink, 'International Norm Dynamics and Political Change', *International Organization* 52/4, 895, see also 912-914.

⁴⁶ Tannenwald, *Nuclear Taboo*, 51.

also saw the political costs as subject to manipulation, and developed strategies to minimise these costs.

The November 1961 decision about the use of anti-plant agents provides a good example of the logic of consequences at work. In National Security Memorandum 115, President Kennedy gave approval for a limited use of defoliants for route clearance, while postponing operations for food denial, border control, and other anti-plant operations until particular conditions were met.⁴⁷ Before granting approval, the President received memos from both the Department of Defense and from the Department of State.

In the Defense memo, Deputy Secretary of Defense Gilpatric laid out the logic of the decision: The 'basic problem is to weigh the political/military effects of the program within Vietnam, along with the possibility of adverse reactions by nations outside Vietnam'.⁴⁸ He recognised that a logic of consequences does not necessarily lead to a decision for use, and presented two possibilities. One was to not to use any anti-plant chemicals 'wholly on the grounds of net adverse local reaction, and particularly of worldwide disapproval'.⁴⁹ Gilpatric left this to the Department of State to judge. The second possibility was 'to go ahead with a selective and carefully controlled program starting with the clearance of key routes, proceeding thereafter to food denial only if the most careful basis of resettlement and alternative food supply has been created, and holding Zone D and the border areas until we have realistic possibilities of immediate military exploitation'.⁵⁰ Gilpatric stated that 'the Department of Defense is inclined toward the latter decision'.⁵¹

The State Department memo did not challenge the consequentialist logic. Instead, Secretary Rusk argued that the military benefits outweighed the political costs and agreed with Gilpatric's recommendations.⁵² He acknowledged that there would be an 'intense

⁴⁷ Papers of John F Kennedy, Presidential Papers, National Security Files, Meetings and Memoranda, National Security Action Memoranda [NSAM]: NSAM 115, Defoliant Operations in Vietnam, JFKNSF-332-017, John F Kennedy Presidential Library and Museum, 'National Security Action Memorandum No. 115', 30 Nov. 1961, available at: <http://www.jfklibrary.org/Asset-Viewer/Z8-vBiaBdEW2Cz9g6NUB7g.aspx> (downloaded 14 May 2014).

⁴⁸ Papers of John F Kennedy, Presidential Papers, National Security Files, Meetings and Memoranda, National Security Action Memoranda [NSAM]: NSAM 115, Defoliant Operations in Vietnam, JFKNSF-332-017, John F Kennedy Presidential Library and Museum, Roswell Gilpatric, 'Memorandum for the President, Subject: Defoliant Operations in Vietnam', 21 Nov. 1961, available at: <http://www.jfklibrary.org/Asset-Viewer/Archives/JFKNSF-332-017.aspx> (downloaded 20 October 2015).

⁴⁹ *Ibid.*

⁵⁰ *Ibid.*

⁵¹ *Ibid.*

⁵² *FRUS*, 1961-1963, Vol. 1, Vietnam, 1961, eds. Ronald D Landa and Charles S Sampson (Washington DC: US Government Printing Office, 1988), Doc. 275, Dean Rusk, 'Memorandum from the Secretary of State to the President', 24 Nov. 1961; see also Jack Schulimson, *The Joint Chiefs of Staff and the War in Vietnam: 1960-1968*, Part 1 (Washington DC: Office of Joint History, Office of the Chairman of the Joint Chiefs of Staff, 2011), 148-150.

Communist “germ warfare” campaign’.⁵³ However, Rusk did not give this much weight, as he was ‘satisfied that successful plant-killing operations in Vietnam, carefully coordinated with and incidental to larger operations, can be of substantial assistance in the control and defeat of the Viet Cong’.⁵⁴ Thus both Gilpatric and Rusk employed consequentialist logic, and both agreed that the military benefits outweighed the political costs.

While this kind of consequentialist logic was present in decision after decision regarding the use of anti-plant and irritant agents by the US in Vietnam, there are also examples of appropriateness arguments. In March 1965, Michael Stewart, Britain’s Foreign Secretary, criticised the US use of irritant agents in Vietnam and implied that it was inappropriate when he called on the ‘US Government in determining the military measures it took to pay “a decent respect for the opinions of mankind”’.⁵⁵ However, while this challenge to the appropriateness of irritant agents annoyed President Johnson, it did not prompt a reappraisal of the use of these agents among American policymakers.⁵⁶

Another example of an appropriateness logic occurred when the Kennedy administration re-considered crop destruction in the fall of 1962. Edward Murrow, the Director of the US Information Agency argued that ‘we have a tradition in this country of not using food as a weapon of war;’ he added that ‘chemical and biological warfare are subjects which arouse emotional reactions at least as intense as those aroused by nuclear warfare’.⁵⁷ However, he opened his argument with a paragraph that gave military utility precedence over political costs, stating that

If we will win Vietnam with defoliants, but lose without them, then we must use them. If we will probably win with defoliants and probably lose without them, then also we must use them. If we might win with defoliants, and might win without them, then we had better consider the implications before undertaking’ the proposed trial of chemical crop destruction.⁵⁸

Murrow ends his memo with the request that if the pilot program is carried out, his team be given time to ‘explain to the world what we are doing and why. This will reduce, to some extent, the impact of the inevitable Communist propaganda campaign’.⁵⁹ The structure of the

⁵³ *FRUS*, 1961-1963, Vol. 1, Doc. 275.

⁵⁴ *FRUS*, 1961-1963, Vol. 1, Doc. 275.

⁵⁵ ‘US told of British Concern on Vietnam: America Urged to Respect “Opinions of Mankind”’, *The Guardian*, 24 March 1965, accessed through ProQuest Historical Newspapers.

⁵⁶ On Johnson’s reaction, see *FRUS*, 1964-1968, Vol. II, Vietnam, January-June 1965, eds. David C Humphrey, Ronald D Landa and Louis J Smith (Washington DC: US Government Printing Office, 1996), Doc. 216, ‘Editorial Note’; see also *FRUS*, 1964-1968, Vol. II, Doc. 330, ‘Memorandum from the President’s Special Assistant for National Security Affairs (Bundy) to President Johnson’, 3 June 1965.

⁵⁷ *FRUS* 1961–1963, Vol. II, Vietnam, 1962, eds. John P Glennon, David M Baehler and Charles S Simpson (Washington DC: US Government Printing Office, 1990), Doc. 266, 16 Aug. 1962. Note that the project in Phu Yen was for crop destruction.

⁵⁸ *FRUS* 1961–1963, Vol. II, Doc. 266.

⁵⁹ *FRUS* 1961–1963, Vol. II, Doc. 266.

memo is suggestive—the first paragraph provided what might be an obligatory deference to military effectiveness. It served as a statement of Murrow's allegiance to the cause (if we will win with them and lost without them, we must use them).⁶⁰ He then presented his criticisms not in absolute terms but in terms of potential political costs, and concluded the memo with a strategy for reducing the political costs associated with the use of these agents. Thus, despite his concern with the use of these agents, he focussed on consequences and gave more weight to issues of military utility.

While historically, 'conscience', 'civilization', and 'the opinion of mankind' figure in American policy pronouncements on chemical weapons, in the 1960s the Kennedy and Johnson Administrations did not accept that these terms had relevance for the use of anti-plant or irritant agents.⁶¹ While American decision makers recognised that others might disagree, they decided that the military utility of the agents outweighed any political costs that might arise from that disagreement.⁶² Indeed, the US held to this position despite evidence that many members of the United Nations thought the Geneva Protocol did cover anti-plant and irritant agents.⁶³

Thus, the dominant logic of action in US decision-making on the use of both anti-plant and irritant agents was one of consequences, not appropriateness. As we will see in more detail in the following sections, norms did figure into this consequentialist reasoning, but they appeared largely as a generator of 'political costs' that policymakers saw as manipulable and as outweighed by the military benefits.

⁶⁰ Dean argues that in George Ball's memos criticising US policy, Ball carefully established his commitment to the cause before challenging the proposed means, and instead of challenging the wisdom of an interventionist US policy, he addressed the question in terms of whether the costs of intervention outweighed the benefits. See Dean, *Imperial Brotherhood*, 235.

⁶¹ For earlier statements, see George Bunn, 'Banning Poison Gas and Germ Warfare: Should the United States Agree?' *Wisconsin Law Review* 1969 (375), 399; 'President Franklin D Roosevelt's Statement on the Use of Poison Gas', White House Press Release, 5 June 1942, available at <http://www.ibiblio.org/pha/policy/1942/420605b.html> (downloaded 19 June 2014); Franklin D Roosevelt, 'Statement Warning the Axis Against Using Poison Gas', 8 June 1943, online by Gerhard Peters and John T Woolley, The American Presidency Project, <http://www.presidency.ucsb.edu/ws/?pid=16407>.

⁶² As Brian Rappert demonstrates in his discussion of cluster bombs and International Humanitarian Law, we can also ask questions about the process by which military benefits and political costs are evaluated and the extent to which they are actually weighed against each other. See Brian Rappert, *How to Look Good In a War: Justifying and Challenging State Violence* (London, Pluto Press, 2012). I thank one of my anonymous reviewers for recommending Rappert. There are also interesting questions to ask about who did the weighing, who did the evaluating, and who had the status to challenge conclusions. The question of who has the status to challenge is raised in the science and technology literature in terms of scientific arguments; this case suggests that the military is in a privileged position when it comes to judgements about military utility.

⁶³ A short overview of discussions at the UN is provided in US Arms Control and Disarmament Agency (ACDA), 'The US Arms Control and Disarmament Agency during the Johnson Administration, II. Policy and Negotiations, K. Other Measures, 2. Chemical And Biological Weapons', Final Draft, no date. *Declassified Documents Reference System [DDRS]*, Gale, Doc. number CK3100335632, 11-13 and 15.

The Role of Military Utility

The previous section examined the logic of decision-making that policy makers employed when determining whether to use anti-plant and irritant agents in Vietnam. In the consequentialist logic employed, policy makers weighed the military benefits of use against the political costs. This concern with military utility accords with structural realism's expectations. Structural realism argues that the anarchic nature of the international system constrains states to be concerned with security.⁶⁴ While realists understand the effect of anarchy and other structural characteristics to be constraining and not determinative, their expectation is that, particularly in times of war, a weapon's military utility will play a primary role in a state's decision regarding its use.

William Truehart's explanation of Ambassador Notting's position on area bombing and crop destruction illustrates this constraint:

Given the fairly desperate position we find ourselves in in Vietnam, he wants to be very sure of his ground before rejecting any weapon which might help to win the war, and he is understandably reluctant to draw conclusions on vital questions on the basis of a priori reasoning—which is about all we have to go on at this point.⁶⁵

As I demonstrate below, a concern with military utility dominated American decision-making on the use of anti-plant and irritant agents in Vietnam. Three types of military utility received attention: technical effectiveness (would the weapon have the desired result on the target?), tactical utility (would use of the weapon help to accomplish US goals in Vietnam?), and strategic effectiveness (would the weapon help to accomplish US strategic goals overall?).⁶⁶ As we will see, to reach a decision about use policy makers weighed military utility against political costs.

Technical effectiveness

Technical effectiveness refers to whether a weapon 'works' in a narrow, technical sense: Does it have the desired result on the target? Compared to other aspects of military utility, this one is relatively clear: a gun may repeatedly fail to discharge a bullet; a chemical agent may fail to have an effect on the plants on which it is sprayed; airdropped bombs may fail to ignite a self-sustaining forest fire.⁶⁷ At the same time, we should not exaggerate the clear-cut

⁶⁴ Waltz, *Theory of International Politics*.

⁶⁵ FRUS 1961–1963, Vol. II, 1962, Doc. 58, 'Letter from the Deputy Chief of Mission in Vietnam (Truehart) to the Director of the Vietnam Task Force (Cottrell)', 12 Feb. 1962.

⁶⁶ Decision makers were concerned with the military utility of 'conventional' weapons as well—this is clearest in the debates over the conventional bombing of North Vietnam.

⁶⁷ Repeated attempts to start forest fires in Vietnam failed and were eventually abandoned. See the discussion of 'Project "Pink Rose"' in Collins, 'Herbicide Operations'; see also Joseph Trevithick, 'Firestorm: Forest Fires as a Weapon in Vietnam', 13 June 2012, available at

nature of technical effectiveness; as Donald MacKenzie argues, a central conclusion from the sociology of scientific knowledge is the 'in-principle challengeability of all technical arguments'.⁶⁸ He further argues that 'what constitutes an adequate test of a weapon is a socially negotiated matter'.⁶⁹ Nonetheless, in this case American decision makers treated technical effectiveness as a technical question that was subject to a clear answer.⁷⁰

In Vietnam, the technical effectiveness of anti-plant weapons was less certain than was the technical effectiveness of irritant agents, for two reasons. First, in the early 1960s irritant agents were further developed as a weapon than were anti-plant agents.⁷¹ Indeed, when the controversy over the use of irritant agents broke out in March 1965, McGeorge Bundy explained to President Johnson that irritant weapons 'are standard issue for all US troops with riot-control missions....[and] are also standard issue under Military Assistance Programs to friendly troops with riot-control missions'.⁷² In contrast, there were no standardised chemical anti-plant agents or weapons in the arsenal.⁷³ Second, while anti-plant agents were in use domestically for civilian purposes and known to be effective against plant life in the US, it was not known whether the agents would be effective against the plants and in the climate of Vietnam.

<http://www.armchairgeneral.com/firestorm-forest-fires-as-a-weapon-in-vietnam.htm> (accessed 15 October 2015); Annie Jacobsen, *The Pentagon's Brain: An Uncensored History of DARPA, America's Top Secret Military Research Agency* (NY: Little, Brown and Comp., 2015), 191-193.

⁶⁸ Donald MacKenzie, *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance* (Cambridge, MA: MIT Press, 1990), 130; see also Donald MacKenzie and Judy Wajcman, eds., *The Social Shaping of Technology* 2nd edition (Maidenhead, UK: Open University Press, 1999), esp. the chapter by Ronald Kline and Trevor Pinch, 'The Social Construction of Technology', 113-115.

⁶⁹ Donald MacKenzie, 'Towards an Historical Sociology of Nuclear Weapons Technologies', in *Arms Races: Technological and Political Dynamics* eds. Nils Petter Gleditsch and Olav Njolstad (London: Sage 1990), 135. See also MacKenzie and Wajcman, 'Introduction: Military Technology' in MacKenzie and Wajcman, eds., *The Social Shaping of Technology*, 347, and James Fallows, 'The American Army and the M-16 Rifle' in MacKenzie and Wajcman eds. *The Social Shaping of Technology*, 382-394 for a discussion of effectiveness, organisational politics and the M16 rifle.

⁷⁰ MacKenzie argues that technical facts are part of a web of knowledge, and that social forces influence both how facts are constructed and who has the credibility to challenge facts in a specific context. See MacKenzie, *Inventing Accuracy*. This is suggestive for this case: as above, American decision makers took the findings of scientists about technical utility as fact and fed them into the policy process without challenge. It is suggestive in other ways as well: First, civilian scientists played a key role in criticising US policy on anti-plant and irritant agents, and second, this directs our attention to the role of the military as experts in a national security context and the difficulty of challenging their conclusions regarding tactical utility.

⁷¹ Davis reports that together with four munitions for its use, CS was 'standardised...as the riot control agent of choice on 30 June 1959'. See Davis, *Riot Control Weapons*, 3. The United States had researched herbicides but did not use them in either World War II or Korea. On the development of military herbicides, see Buckingham, *Operation Ranch Hand*, 1-8; AL Young, *The History, Use, Disposition and Environmental Fate of Agent Orange* (New York: Springer-Verlag, 2009), esp. Ch. 2, 23-55; William F Warren, 'A Review of the Herbicide Program in South Vietnam', Commander in Chief Pacific, Scientific Advisory Group, Working Paper No. 10-68, AD-779 797 (August 1968) <http://www.dtic.mil/dtic/tr/fulltext/u2/779797.pdf>.

⁷² See *FRUS*, 1964-1968, Vol. II, Doc. 210, 23 March 1965.

⁷³ There was at least one standardized biological anti-plant, wheat rust. My research to date has discovered no discussion of the use of anti-plant biological agents in Vietnam; I will address the significance of this absence in future work.

Anti-plant agents received attention in the Vietnam context as early as April 1961, as part of the effort to explore 'which of the various techniques and gadgets now available or being explored might be relevant and useful in the Vietnam operation'.⁷⁴ The following month, Kennedy received a proposed program of Action for Vietnam. Among other things, it suggested the development of 'modern technological area-denial techniques' to help control the border, as well as the establishment of a Combat Development and Test Center (CDTC) to develop new technologies for use against the Viet Cong.⁷⁵ In June, William Godel, Deputy Director of the Advanced Research Projects Agency, Department of Defense, visited Vietnam where he met with US and Vietnamese officials. He described various items that the Combat and Development Test Center might develop, including anti-plant agents for crop destruction and defoliation.⁷⁶ The CDTC was established quickly, and it conducted the first tests of anti-plant agents in Vietnam in August. By 2 October, the American Embassy in Saigon reported that the 'initial tests have been successful' and that plans for use were in development.⁷⁷

That same month the President sent General Maxwell Taylor to Vietnam to assess how the US could best support South Vietnam against increased VC activity. In his report, Taylor lists 'manioc and rice plant destructant' as well as 'Zone D and Border defoliant' as items that, in testing, have 'demonstrated sufficient utility to justify the introduction of operational quantities'.⁷⁸ However, technical effectiveness is only one aspect of military utility; decision makers also considered tactical and strategic utility.

⁷⁴ *FRUS* 1961-1963, Vol. I, Doc. 27, Walt Rostow, 'Memorandum from the President's Deputy Special Assistant for National Security Affairs (Rostow) to the President', 12 April 1961; see also Buckingham, *Operation Ranch Hand*, 9-10; Schulimson, *The Joint Chiefs of Staff*, 148.

⁷⁵ The plan was a product of the Presidential Task Force on Vietnam, headed by Roswell Gilpatric. See Buckingham, *Operation Ranch Hand*, 10-11; *FRUS* 1961-1963, Volume I, Vietnam, 1961, Doc. 42, 3 May 1961; *FRUS* 1961-1963, Volume I, Doc. 52, 'National Security Action Memorandum No. 52', Point 3, 11 May 1961; *FRUS* 1961-1963, Vol. I, Doc. 56, 'Telegram from the Department of State to the Embassy in Vietnam', 20 May 1961. See also *Pentagon Papers [United States - Vietnam Relations, 1945-1967]*, IV.B.1, Evolution of the War Counterinsurgency: The Kennedy Commitments, 1961-1963. The Kennedy Commitments and Programs, National Archives Identifier: 5890493, 'Memorandum for the President, Subject: South Vietnam' (11 Nov. 1961) from Office of the Secretary of Defense, Vietnam Task Force, 58-86, available at: <https://www.archives.gov/research/pentagon-papers/> (accessed 14 October 2015) for a discussion of the decisions made about Vietnam in April and May 1961. This led to Project AGILE, a project of the Advanced Research Projects Agency, which was to investigate anti-plant agents among other new techniques. See Advanced Research Projects Agency, Project Agile, 'Semi-Annual Report, 1 July -31 December 1963', (Alexandra, VA: Department of Defense, 1 February 1964), 1, available at: <http://specialcollections.nal.usda.gov/sites/specialcollections.nal.usda.gov/files/00340.pdf>.

⁷⁶ See *FRUS* 1961-1963, Vol. I, Doc. 96, 'Editorial Note'. As reported here, President Diem expressed his interest in the development of a defoliant during Godel's visit.

⁷⁷ Buckingham, *Operation Ranch Hand*, 11; *FRUS* 1961-1963, Vol. I, Doc. 143, 'Telegram from the Embassy in Vietnam to the Department of State', 2 October 1961.

⁷⁸ Papers of John F Kennedy, Presidential Papers, National Security Files, Countries, Vietnam: Subjects: Taylor Report, 3 Nov. 1961: Rostow Working Copy: Tabs VI-VIII, JFKNSF-203-005, John F Kennedy Presidential Library and Museum, available at: <http://www.jfklibrary.org/Asset-Viewer/Archives/JFKNSF-203-005.aspx> (Accessed 14 May 2014).

Tactical utility

A weapon has tactical utility if it helps to advance the purposes of the user within the theatre of operations; a weapon can have tactical utility in some contexts and not others. For policy makers, the question was whether anti-plant and irritant agents had utility in the Vietnam War. Here we will look first at anti-plant agents and then at irritant agents, examining arguments about tactical utility and how that utility was weighed against political costs.

The tactical utility of anti-plant agents: The military logic for the use of anti-plant weapons depends on whether we are talking about the use of these agents for defoliation or for crop destruction. The military logic of defoliation was that it would increase visibility and by doing so, help to prevent ambush and allow easier location of the enemy; its use was proposed along lines of communication, along the border to help counter infiltration, and in combat zones.⁷⁹ However, there were those in the Kennedy Administration who challenged this logic. For example, according to a memo prepared in the State Department, 'While visibility is without question improved by defoliation, RGK Thompson and some of our own military say the remaining tree trunks, limbs and twigs often provide quite adequate cover'.⁸⁰ In other words, even if defoliation was technically effective and improved visibility, the VC could still use the general landscape and tree remaining branches and tree trunks for coverage during an ambush. Further, according to Robert Johnson, Walt Rostow suggested that defoliation simply cleared the way for the VC, because improved lines of sight can work to the advantage of both the defender and the attacker.⁸¹

In their discussions, policymakers weighed the potential military gains against the potential political costs. They discounted the latter, in part because the proposed use on lines of communication was similar to the domestic use of defoliants along highways and railroad lines. Policy makers were cautious, however, and as mentioned above in November

⁷⁹ See, for example, *FRUS* 1961-63 Vol. I, Doc. 343, 28 Dec. 1961; see also SIPRI, *Rise of CB Weapons*, 177.

⁸⁰ See, for example, *FRUS* 1961-63 Vol. III, Doc. 96, 18 April 1963. Brigadier Robert GK Thompson was the head of the British Advisory Mission in Vietnam. In his memoir, Hilsman claims that 'the State Department view...was that the political repercussions [of the use of defoliants] would outweigh any possible gains'. See Roger Hilsman, *To Move a Nation: The Politics of Foreign Policy in the Administration of John F Kennedy* (NY: Doubleday & Company, 1967), 443. In the available documents, the State Department expresses concern but never argues unconditionally that costs will outweigh benefits.

⁸¹ This is Robert Johnson's understanding of Walt Rostow's argument; see *FRUS*, 1961-1963, Vol. 1, Doc. 166, 14 Oct. 1961. Johnson countered it with the observation that 'a guerrilla force benefits more from forest cover than an anti-guerrilla force'.

1961 Kennedy approved only a limited trial, evaluation of which would provide a basis for further decisions.⁸²

A year later, in November 1962, McNamara wrote again to the President, requesting approval for five specific operations and the transfer of authority to approve defoliation operations to the US Ambassador in Vietnam and the Commander of the US Military Assistance Command, Vietnam (COMUSMACV). He reported low political costs, high technical effectiveness, and tactical utility in terms of increased visibility and a reduction in 'the susceptibility of the sprayed areas to ambush'.⁸³ According to McNamara, the tactical military benefits of defoliation operations were greater than their political costs, and the President thus agreed to McNamara's recommendations.⁸⁴

The military argument for crop destruction was that it would deny South Vietnamese crops to the Viet Cong and North Vietnamese soldiers, and that any additional effort they had to expend on food lessened the effort they could spend on military activities.⁸⁵ There were arguments about whether the conditions in South Vietnam were appropriate for this—some argued that crop destruction would not have a significant effect, either because food was too abundant in South Vietnam or because it was relatively easy for the North Vietnamese to bring in the supplies that they needed.⁸⁶ However, the general logic of how crop destruction was to contribute to the US war effort was clear.

The policy discussion centred on whether crop destruction would undermine US efforts in the struggle for political allegiance. This was in part due to uncertainty about whether it was possible to distinguish between crops that would be used by the enemy (the destruction of which could provide military gain) and crops that would be used by civilians

⁸² McNamara had requested an extension of the trial defoliation operations in February 1962. See Papers of John F Kennedy, Presidential Papers, National Security Files, Meetings and Memoranda, National Security Action Memoranda [NSAM]: NSAM 115, Defoliant Operations in Vietnam, JFKNSF-332-017, John F Kennedy Presidential Library and Museum, Robert S. McNamara, 'Memorandum for the President, Subject: Defoliant Operations in Vietnam', 2 Feb. 1962, Item 3d, available at: <http://www.jfklibrary.org/Asset-Viewer/Archives/JFKNSF-332-017.aspx> (downloaded 14 May 2014).

⁸³ *FRUS*, 1961-1963, Vol. II, Doc. 317, 'Memorandum from the Secretary of Defense (McNamara) to the President', 16 Nov. 1962. McNamara makes clear that approval by both the Ambassador and the military commander is required, and that 'specific psychological warfare precautions' would continue.

⁸⁴ *FRUS*, 1961-1963, Vol. II, Doc. 317. While each proposed operation had to make its way through a complicated approval process, the transfer of approval authority set the stage for an expansion in the number of operations. Kennedy made some effort to monitor the operations and to maintain some limits; in footnote 3 of this document, the editors of *FRUS* note that the President 'wanted to be consulted on any operation beyond these limits and desired to be informed of the results of future operations'.

⁸⁵ See, for example, Cable, Ambassador Nolting the Secretary of State, 25 Aug. 1962, Papers of John F Kennedy, National Security Files, Countries, Box 196, Folder: 'Vietnam, General, 8/23/62-8/31/62', Item 10, John F Kennedy Presidential Library and Museum [JFKL].

⁸⁶ See, for example, *FRUS*, 1961-1963, Vol. II, Doc. 250, 'Memorandum from the Director of the Bureau of Intelligence and Research (Hilsman) to the Assistant Secretary of State for Far Eastern Affairs (Harriman), 28 July 1962.

(the destruction of which would create animosity and potentially help the Viet Cong in the struggle for hearts and minds).⁸⁷

Thus, in April 1962, the Department of State advised the American Embassy in Saigon that that the 'primary consideration of any crop destruction program is to ensure that it will not result in US and GVN absorbing adverse propaganda criticism and adverse local reaction without achieving any commensurate military advantage'.⁸⁸ The President's staff then informed both the State and the Defense Departments that the President should not receive a request to supply chemicals to the GVN for crop destruction until there was evidence for both technical and tactical effectiveness. Specifically, the President required

a thorough discussion of all of the factors can be assembled, including: 1) scientific assurance based upon extensive testing that the herbicides are completely effective [and] 2) a selection of targets based upon sound intelligence, which would justify the conclusion that crop destruction will produce sufficiently valuable military results to justify the political cost.⁸⁹

However, and in part pushed by the South Vietnamese government, it was less than six months before the question of crop destruction was back on the President's desk.⁹⁰

Conflicting opinions about the tactical benefits and political costs still existed. Ambassador Nolting made the case for tactical benefits, arguing that even small-scale successful crop destruction would complicate VC and DRV logistical and operational planning.⁹¹ Secretary Rusk argued against, stating that crop destruction was premature because it would not yet yield military benefits.⁹² Michael Forrestal sent Kennedy a summary memo on 28 September reporting that Secretary McNamara, General Taylor and the field were all in favor of crop destruction; Averell Harriman and Roger Hilsman

⁸⁷ See, for example, Fred J Delmore et al., 'Review and Evaluation of ARPA/OSD "Defoliation" Program in South Vietnam: Summary Report (Arlington VA: Defense Advanced Research Projects Agency, 15 July 1962), Appendix C, 5, available at: <http://www.dtic.mil/dtic/tr/fulltext/u2/a950097.pdf> downloaded 3 March 2015; Memo, Dean Rusk to the President, Subject: Vietnam: Project for Crop Destruction, 23 Aug. 1962, Papers of John F Kennedy, National Security Files, Countries, Box 196, Folder: 'Vietnam, General, 8/23/62-8/31/62, Item 5, JFKL.

⁸⁸ Department of State, 'Outgoing telegram to American Embassy, Saigon', 30 April 1962, *DDRS*, Gale, Doc. number CK3100482789.

⁸⁹ FRUS 1961–1963, Vol. II, Doc. 178, 'Memorandum from Michael V Forrestal of the National Security Council to the President', 2 May 1962.

⁹⁰ Cable, Department of State to American Embassy Saigon, 25 Sept. 1962, Papers of John F Kennedy, National Security Files, Countries, Box 196, Folder: 'Vietnam, General, 9/22/62-9/29/62', Item 15, JFKL and Cable, Department of State to American Embassy Saigon, 26 Sept. 1962, Papers of John F Kennedy, National Security Files, Countries, Box 196, Folder: 'Vietnam, General, 9/22/62-9/29/62', Item 18, JFKL. Relevant documents on crop destruction during this period can be found in Papers of John F Kennedy, National Security Files, Countries, Box 196, Vietnam, folders for July, August and September as well as Box 197, Folder 'Vietnam: General, 10/1/62-10/6/62', JFKL.

⁹¹ 'Incoming Telegram, Ambassador Nolting to Secretary of State, No 356', 27 Sept. 1962, Papers of John F Kennedy, National Security Files, Countries, Box 196, Folder: 'Vietnam, General, 9/22/62-9/29/62, Item 21, JFKL.

⁹² Memo, Dean Rusk for the President, Subject: Vietnam: Project for Crop Destruction, 23 Aug. 1962, Papers of John F Kennedy, National Security Files, Countries, Box 196, Folder: 'Vietnam, General, 8/23/62-8/31/62, Item 5, JFKL.

still had doubts; that the program was premature; and that Murrow believed it would have significant political costs.⁹³ On 2 October, the President granted approval for a crop destruction trial; given the division among his advisors, Kennedy may have felt that a trial to collect more information was the best way to proceed.⁹⁴ As with the first defoliant operations, the purpose of the trial was to evaluate the military benefits and political costs. Kennedy requested a report on the results of the trials, and he personally followed up on the issue at least once.⁹⁵

Even after the trials, the lack of definitive evidence for or against the tactical utility of both defoliation and chemical crop destruction was clear.⁹⁶ Despite the lack of conclusive evidence, the operations continued. At least for the question of anti-plant agents, the burden of proof seems to have been put on arguments for lack of utility; since forces in the field continued to request the use of anti-plant agents, that burden was not met.⁹⁷

The Tactical Utility of Irritant Agents Although as mentioned above the technical effectiveness of irritant agents was already established, their tactical utility was less clear. Davis reports that in 1962 the head of the US Army Chemical-Biological-Radiological Agency, Brigadier General Fred J. Delmore, went to Vietnam and ‘made some suggestions as to the utility of the new riot control agent in the unconventional type of warfare then going on’.⁹⁸ In June 1963, the Army conducted ‘a full scale troop test’ known as ‘Operation Water

⁹³ Memo, Michael V Forrestal for the President, Subject: Crop Destruction in Vietnam, 28 Sept. 1962, *DDRS*, Gale, Doc. number CK3100210020.

⁹⁴ For the decision, see Memo, Michael V Forrestal for the Record, Subject: Crop Destruction, 2 Oct. 1962, Papers of John F Kennedy, National Security Files, Countries, Box 197, Folder: ‘Vietnam, General, 10/1/62-10/6/62’, Item 4, JFKL. Forrestal believed Kennedy’s ‘main train of thinking was that you cannot say no to your military advisors all the time, and with this I agree’. See *FRUS 1961–1963*, Vol. II, Doc. 294, Footnote 4 to ‘Telegram from the Embassy in Vietnam to the Department of State’, 26 Sept. 1962, which cites Department of State, Central Files, NSC Staff Memorandum, Michael Forrestal, 6/22-10/62.

⁹⁵ See *FRUS 1961-1963*, Vol. III, Doc. 58, ‘Memorandum from Michael V Forrestal of the National Security Council Staff to the Assistant Secretary of State for Far Eastern Affairs (Harriman), Subject: Defoliation and Crop Destruction Operations in Vietnam’, 13 March 1963. The next month, the President had a telegram sent from Palm Beach asking for a report on the use of anti-plant agents with instructions to ‘stop any further use until there has been an analysis’. See *FRUS, 1961-1963*, Vol. III, Doc. 90 ‘Telegram from Michael V Forrestal of the National Security Council Staff to the President, at Palm Beach Florida’, 16 April 1963.

⁹⁶ See, for example, *FRUS, 1961-1963*, Vol. III, Doc. 96 ‘Memorandum Prepared in the Department of State, Subject: Chemical Defoliation and Crop Destruction in South Vietnam’, 18 April 1963; *FRUS, 1961-1963*, Vol. III, Doc. 242 ‘Telegram from the Embassy in Vietnam to the Department of State’, 30 July 1963.

⁹⁷ Hersh quotes Lt. General William W. Dick, Jr. as testifying in 1965 that ‘we still have requirements from the commanders in Vietnam for defoliating agents....I can only assume that they find it has an ability to perform a job they want done’ (Hersh, *Chemical and Biological Warfare*, 150). Similarly, as reported by SIPRI, ‘In December 1969 a US official stated that requests from field commanders for defoliation and crop destruction always exceeded US spray capacity’ (SIRPI, *Rise of CB Weapons*, 178).

⁹⁸ Davis, ‘Riot Control Weapons’, 4.

Bucket' that demonstrated the effectiveness of CS in five tactical situations: 'ambush of a foot patrol, ambush of a vehicle convoy, attack by a rifle company against a hostile assembly area, helicopter-borne attack on village, and enemy attack on a small outpost'.⁹⁹ As the war developed, US soldiers discovered additional utilities such as clearing tunnels and underground shelters.¹⁰⁰

Combat use began in late 1964 and, as with anti-plant agents, there were diverse opinions on whether irritant agents were militarily effective.¹⁰¹ As with anti-plant agents, when tactical utility was questioned it was possible to fall back on the preferences of the forces in the field. When Westmoreland requested renewed authority to use irritant agents in September 1965, he stated that 'tactical commanders at all levels of US and ARVNN forces have stated a desire to use RCA in tactical operations'.¹⁰² Similarly, Admiral Lemos argued in 1969 that soldiers chose to carry fewer high explosive weapons so that they could carry tear gas weapons.¹⁰³

However, unlike anti-plant agents, there was no sustained examination of tactical utility or political costs by top decision makers. As mentioned above, Kennedy requested and received reports on the effectiveness of anti-plant agents, and these evaluations continued into the Johnson administration, at least partially in response to criticism of their use.¹⁰⁴ The

⁹⁹ Davis, 'Riot Control Weapons', 4. It also demonstrated the need for new munitions.

¹⁰⁰ Memo, Earle G. Wheeler, Chairman, Joint Chiefs of Staff to the Secretary of Defense, Subject: Use of Riot Control Munitions in Vietnam (C), JCSM-685-65, 9/11/65, #3a, 'Gas', Vol. II', National Security File, Country File, Vietnam, Box 194, LBJ Library.

¹⁰¹ In fact, the news stories that reported the first use of irritant agents use also noted that they were ineffective. See, for example, John W Finney, 'Rusk Defends Use of Nonlethal Gas in War in Vietnam', *New York Times*, 25 March 1965. See also Krache Morris, *Into the Wind*, who argues that the use of anti-plant agents was counter-productive and then explores why the Kennedy Administration began and then continued their use, and Gregory A Daddis, *No Sure Victory: Measuring US Army Effectiveness and Progress in the Vietnam War* (Oxford: Oxford UP, 2011), who examines the broader issue of measuring military success in Vietnam.

¹⁰² Cable, COMUSMACV to CINCPAC, Subject: Tactical use of Riot Control Agents (RCA), received White House 9 Sept. 1965, #5, 'Gas, Vol. II', Country File, Vietnam, NSF, Box 194, LBJ library. Note that Westmoreland's request is for the 'specific purpose of clearing tunnels, caves and underground shelters encountered in tactical operations'. Ambassador Lodge in Vietnam endorsed the request, as did the Joint Chiefs of Staff. In their memo to the Secretary of Defense, the JCS widens the requested authority to 'use of riot control agents in combat operations'. (See Memo, JCS to Secretary of Defense, Subject: Use of Riot Control Munitions in Vietnam, 11 Sept. 1965, #3a, 'Gas, Vol. II', Country File, Vietnam, NSF, Box 194, LBJ library.) The US Ambassador to the UN, Goldberg, requested that no use be made of irritant agents until the conclusion of the UN General Assembly, to avoid an opportunity for Soviet bloc propaganda. More generally, he advocated a careful weighing of the military utility of irritant agents against their political costs. In the advent of a decision to use them, he advised a publicly campaign to explain the policy before their use. See Cable, USUN New York (Goldberg) to Secretary of State, Subject: Gas in Vietnam, 15 Sept. 1965, #28, 'Gas, Vol. II', Country File, Vietnam, NSF, Box 194, LBJ library.

¹⁰³ See the testimony of Admiral Lemos, as quoted by SIPRI, *Rise of CB Weapons*, 198.

¹⁰⁴ See, for example, Delmore et al., 'Review and Evaluation'; Collins, 'Herbicide Operations'; Russell Betts and Frank Denton, 'An Evaluation of Crop Destruction in Vietnam, Memorandum RM-5446-1-ISA/ARPA, (Santa Monica, CA: Rand, October 1967), available at: <https://www.rand.org/content/dam/rand/pubs/research.../RM5446-1.pdf> (downloaded 18 October 2015); Anthony J Russo, 'A Statistical Analysis of the US Crop Spraying Program in South Vietnam',

use of irritant agents was examined in various After Action Reports, as were other tactics and weapons, but this fed into the development of doctrine and munitions, not into any reconsideration of the use of these weapons.¹⁰⁵

The difference in the scrutiny given to anti-plant and irritant agents may be attributable, in part, to the fact that the US military had already accepted irritant agents. Thomas Hughes argues that 'evolving technological systems', which he defines as including both technical and social elements, 'are time dependent', and that over time, they become more difficult to shape.¹⁰⁶ This suggests that to the extent that the use of irritant agents was institutionalised (e.g. standard issue under Military Assistance Programs), they would be more difficult to challenge.¹⁰⁷ In the same way, the domestic use of both anti-plant and irritant agents meant that these agents were part of a technological system where the use of these agents were seen as safe and useful; it also meant there were vested interests in the continued use of these weapons. This made it more difficult to challenge their use in Vietnam.

The challenges that did occur had little effect on policy in Vietnam. Once the Utter case in September 1965 made the humanitarian case, there appears to have been no reconsideration of their use. Moreover, as discussed further below, little was done to ensure that use lived up to the promised humanitarian role.

Strategic effectiveness

For the purposes of this article, 'strategic effectiveness' refers to the extent to which the use of particular weapons was seen as furthering or complicating broader US policy goals,

Memorandum, RM-5450-1-ISA/ARPA (Santa Monica, CA: Rand, October 1967), available at: http://www.rand.org/pubs/research_memoranda/RM5450-1.html (downloaded 18 October 2015); Warren, 'Review of the Herbicide Program'; Project CHECO, 'Ranch Hand: Operations in SEA', (San Francisco: Department of the Air Force, Headquarters Pacific Air Forces, 13 July 1971), available at: <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA484753> (downloaded 9 March 2015); and Engineer Strategic Studies Group, 'Herbicides and Military Operations', Volume 1, Main Paper (Department of the Army, February 1972), <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=AD0893214> (downloaded 15 June 2014).

¹⁰⁵ See Ellison, *Chemical Warfare*; Hay, Tactical and Materiel Innovation, 36-38; Combat Operations After Action Report (RCS MACV j3/32), 28 April 1966, Folder 18, Box 01, Operation Masher/Operation White Wing Collection, The Vietnam Center and Archive, Texas Tech University, accessed 11 June 2014, available at: <http://www.vietnam.ttu.edu/virtualarchive/items.php?item=1710118001>; US MACV, 'Lessons Learned No. 52: Operational Employment of the Mity Mite Portable Blower', 22 Nov. 1965, available at <http://cgsc.cdmhost.com/cdm/ref/collection/p4013coll11/id/1487>.

¹⁰⁶ Thomas P Hughes, 'Technological momentum', in *Does Technology Drive History?: The Dilemma of Technological Determinism* eds. Merritt Roe Smith and Leo Marx (Cambridge, MA: MIT Press, 1994), esp. 108, 111, 112. I thank an anonymous reviewer for suggesting this connection to Hughes' work.

¹⁰⁷ Hilsman makes a similar argument about napalm, arguing that in 1962 'the battle over napalm...had long since been lost. It was a standard item of issue, and the Vietnamese Air Force already had ample supplies'. See Hilsman, *To Move a Nation*, 442.

including the preservation of an independent South Vietnam, containment of the Soviet Union, and the prevention of nuclear war. Debates about the strategic effectiveness of particular weapons thus include debates about the international political costs likely to be associated with their use and the potential for undesired escalation.

There was little focus in American policy discussions on the strategic effectiveness of anti-plant and irritant agents in Vietnam.¹⁰⁸ International-political costs received some attention early on, but as the states that complained the most were Communist, US decision makers dismissed the complaints as propaganda. The influence of the germ war allegations made in the Korean War is interesting here.¹⁰⁹ It definitely led to an expectation that Communist states would make an issue of American use of anti-plant and irritant agents.¹¹⁰ It may also have convinced US policy makers that such a campaign would not have much political effect.¹¹¹

Indeed, international-political costs were generally low. As discussed above, for a brief moment in March 1965, both friends and foes were critical of the United States' use of irritant agents in Vietnam, but this blew over quickly. There were also efforts at the United Nations (UN) to oppose the US use of irritant and anti-plant agents. Between 1966 and 1972 'at least six General Assembly resolutions' were adopted that 'urged universal adherence to the Protocol or called for strict observance of its principles'.¹¹² However, the US was able to blunt this opposition, as its allies generally avoided directly criticising the US either by accepting US efforts to weaken proposed resolutions or by abstaining on key votes. The strongest action came in December 1969, when 80 members of the UN General Assembly interpreted the Protocol as covering anti-plant and irritant agents by voting for Resolution 2603 (XXIV); the US was joined by Australia and Portugal in voting against, while 36 states

¹⁰⁸ Preliminary research suggests that these effects are much larger for the non-use of nuclear, biological and lethal chemical agents.

¹⁰⁹ North Korea, China and the USSR accused the United States of using biological weapons during the Korean War. For more on these allegations, see SIPRI, *Rise of CB Weapons*, 224-225; LTC George W Christopher et al., 'Biological Warfare: A Historical Perspective', *JAMA* 278/5 (6 August 1997), 414-415; Conrad C. Crane, 'Chemical and Biological Warfare during the Korean War: Rhetoric and Reality', *Asian Perspectives*, 25/ 3 (2001), 61-83; John Ellis van Courtland Moon, 'Biological Warfare Allegations: the Korean War Case', *Annals of the New York Academy of Sciences*, 666 (1992), 53-83; Milton Leitenberg, 'False Allegations of US Biological Weapons Use during the Korean War', in *Terrorism, War or Disease: Unravelling the Use of Biological Weapons* eds. Anne L. Clunan, Peter R. Lavoy, and Susan B. Martin (Palo Alto, CA: Stanford University Press, 2008), 120-143; Milton Leitenberg, 'A Chinese Admission of False Korean War Allegations of Biological Weapon Use by the United States', *Asian Perspective* 40/1 (January-March 2016), 131-146; Stephen Endicott and Edward Hagerman, *The United States and Biological Warfare: Secrets of the Early Cold War and Korea* (Bloomington:, Indiana UP, 1998).

¹¹⁰ See, for example *FRUS* 1961-1963, Vol. I, Doc. 265, 'Memorandum from the Assistant Director, Far East (Nielson) to the Director of the United States Information Agency (Murrow)', 17 Nov. 1961.

¹¹¹ *FRUS*, 1961-63, Vol. II, Doc. 270, 'Memorandum from the Secretary of State to the President', 23 Aug. 1962.

¹¹² John Norton Moore, 'Ratification of the Geneva Protocol on Gas and Bacteriological Warfare: A Legal and Political Analysis', *Virginia Law Review*, 58/3 (March 1972), 429.

abstained.¹¹³ Moore argues that the 36 abstainers ‘included most of the NATO members and many major or significant military powers...whose views would be particularly important in shaping a norm of customary international law’.¹¹⁴ The US dismissed the criticisms it received as ‘partisan’. The ‘conscious of mankind’ was not speaking with a unified voice, and this diminished its influence.¹¹⁵

There was also little concern about the risk of escalation from anti-plant and irritant agents. President Eisenhower raised the possibility that the use of non-lethal chemical weapons would escalate to lethal chemical weapons in a 1960 meeting of the National Security Council.¹¹⁶ Congressional and other critics of the use of anti-plant and irritant agents in Vietnam were also concerned about the possibility of escalation.¹¹⁷ However, I have found no one within the Kennedy, Johnson or Nixon Administrations who argued against the use of anti-plant and irritant agents on these grounds. George Aldrich explains that ‘In 1965 and 1966 some of us in government thought that if the type of gas used in Vietnam could be limited to the type used commonly by democratic governments for the control of riots among their own people, this would provide a built-in restraint against the use of dangerous gases’.¹¹⁸ While officials did consider the potential for nuclear escalation in the Vietnam context, they evidently did not consider the use of anti-plant and irritant agents as a possible cause of escalation.¹¹⁹

Because US decision makers saw both the international political costs of use and the possibility of escalation as low, strategic effectiveness largely reduced to the question of tactical effectiveness for these agents.

¹¹³ For the resolution, see General Assembly Resolution 2603A (XXIV), Question of chemical and bacteriological (biological) weapons, 1836th plenary meeting, 16 December 1969 available at [http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/2603\(XXIV\)&Lang=E&Area=RESOLUTION](http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/2603(XXIV)&Lang=E&Area=RESOLUTION). Johnstone notes that the three who voted against—the US, Australia, and Portugal, were all involved in the use of anti-plant and irritant agents; see L. Craig Johnstone, ‘The United States Understanding of the Geneva Protocol of 1925’, Dec. 1970, Report, Department of State and Institute of Politics at Harvard University, *DDRS*, Gale, Doc. number CK3100518058, 4-5. Johnstone was a career member of the Senior Foreign Service when he wrote this report.

¹¹⁴ Moore, ‘Ratification’, 451.

¹¹⁵ See Moore, ‘Ratification,’ see also George Bunn, ‘Banning Poison Gas’, 404-405 on irritant agents and 406-407 on anti-plant agents.

¹¹⁶ FRUS 1958-1960 Vol. III, Doc. 90, ‘Editorial Note’, 18 Feb. 1960.

¹¹⁷ For example, see Richard D McCarthy, *The Ultimate Folly: War by Pestilence, Asphyxiation and Defoliation* (London: Lowe & Brydone, 1970), 50.

¹¹⁸ George H. Aldrich, ‘Comments’, in *Law and Responsibility in Warfare: The Vietnam Experience* ed. Peter D. Trooboff (Chapel Hill: The University of North Carolina Press, 1975), 175. Aldrich was Assistant Legal Advisor for East Asian and Pacific Affairs in the Department of State from July 1965-October 1969.

¹¹⁹ There was repeated analysis of likely responses from the Soviet Union and China to possible US courses of action. See, for example, Memo, Central Intelligence Agency, Office of National Estimates to the Director, Subject: Communist Reactions to Certain US Courses of Action, 3/13/68, #9, TS-186060, #9, ‘Vietnam 8, 2/68-3/68, Rostow Briefing Book on Military Situation in SVN and Paris Negotiations’, Country File, National Security File, Box 107, LBJ Library.

In this section, I examined the key role that military utility—especially technical effectiveness and tactical utility—played in US decisions regarding the use of anti-plant and irritant agents. Once technical effectiveness was established, for both anti-plant and irritant agents there was a debate over tactical utility; tactical utility was then weighed against political costs. In both cases, the decision was for the use of the agents. In the next section, we will look more closely at norms and the generation of political costs.

Norms

I argued above that in the US decisions regarding the use of anti-plant and irritant agents, norms worked largely instrumentally, by raising the potential political costs associated with their use. As explored below, the possible costs associated with the use of these agents affected how decisions about use were made, led the US to pursue strategies to decrease the costs, and—at least in theory—led to limits on the ways that the agents could be used.

At least three types of norms generated these potential political costs: first, policy makers recognised the existence of a norm against chemical weapons; second, there was a concern with whether the use of these agents was legal; and third, policy makers displayed a concern with effects on non-combatants that presumably derived from the broader laws of war.¹²⁰

The norm against chemical weapons

US policy makers clearly recognised the existence of a norm against chemical weapons that could generate both domestic and international costs. Because of this norm, they saw chemical weapons as having a separate status. For example, Robert Johnson suggested to Walt Rostow in April 1961 that the use of BW or CW ‘is obviously a subject that would warrant Presidential consideration because of the very important international political as well as possible moral considerations involved’.¹²¹ When a decision about anti-plant agents is required in November, Walt Rostow then told President Kennedy that his decision about the ‘use of a weed killer’ in Vietnam was ‘required because this is a kind of chemical warfare’.¹²² The taboo nature of chemical weapons is also suggested by Secretary Rusk

¹²⁰ Other scholars have addressed the interaction between specific weapon taboos and the broader laws of war. For example, Tannenwald argues that Nuclear Taboo ‘drew strength’ from the ‘growing intersection between military and humanitarian norms’. Tannenwald, *Nuclear Taboo*, 366.

¹²¹ Memo, Robert H. Johnson to Mr Rostow, Subject: Guerrilla Warfare Research Relating to South Vietnam, 8 Aug. 1961, Papers of President John F. Kennedy, National Security Files, Countries, ‘Vietnam General, 9/61’, Box 194, Item 9, JFKL.

¹²² *FRUS*, 1961-1963, Vol. I, Doc. 269, Memo from Rostow to the President, 21 Nov. 1961. Note that decisions about the use of other weapons also received top policy maker involvement. A prime example here is napalm; see for example, Memo, Chester L. Cooper for Mr. Bundy, Subject: Gas and Napalm, 23 March 1965, #12, ‘Gas, Vol. I’, Country File, Vietnam, NSF, Box 194, LBJ Library.

when he distinguished between chemical and other means of crop destruction: 'the use of strange chemical agents, to destroy crops, strikes at something basic implanted in human beings (even if the people do not—as many will—fear that the chemical agents are also directly harmful to people)'.¹²³

In the case of irritant agents, the decision regarding use did not initially involve the President. After the Associated Press revealed the 'use of nonlethal gas' by South Vietnamese forces in March 1965, the *New York Times* ran a story with the headline, 'Decision On Gas Not President's, White House Says'.¹²⁴ The President's Press Secretary explained, 'That's not the sort of thing that comes up for that kind of approval. For many years, this kind of authority has been delegated to area commanders'.¹²⁵ However, despite arguments that the use of these agents was routine, critics were astounded at the non-involvement of the President. As Senator Mike Mansfield, Chairman of the Senate Foreign Relations Committee, wrote to President Johnson, 'It is beyond my comprehension how any American in an office of responsibility would not realize the vast significance, beyond immediate military considerations, of [the use of irritant agents], and therefore, seek the highest political authority before taking such a step'.¹²⁶ The 'vast significance' identified by Mansfield stemmed from the norm surrounding chemical weapons.

In their statements defending the use of irritant gases, US officials did not challenge the existence of a norm against chemical weapons—only its application to irritant agents. They distinguished between irritant agents and lethal chemical agents, and reaffirmed that the US 'shared a general abhorrence of "inhuman" forms of warfare'.¹²⁷

These examples show that American policymakers recognised the existence of a norm against chemical weapons, even if they made an exception for anti-plant and irritant agents.

¹²³ FRUS, 1961-1963, Vol. II, Doc. 270, Memo from the Secretary of State to the President, 23 Aug. 1962. Note that in this memo Rusk draws on arguments against crop destruction made in a 'Memo From the Deputy Assistant Secretary of State for Far Eastern Affairs (Rice) to the Assistant Secretary of State for Far Eastern Affairs (Harriman)'; see FRUS 1961-1963, Vol. II, Doc. 256, 2 Aug. 1962.

¹²⁴ See, for example, the story as run in a Texas newspaper: Peter Arnett, 'South Viet Nam Now Employing Nonlethal Gas', *Corsicana Daily Sun* (Corsicana TX), 22 March 1965, 1, available through newspapers.com; Jack Raymond, 'Decision On Gas Not President's, White House Says', *New York Times*, 24 March 1965.

¹²⁵ Jack Raymond, 'Decision on Gas Not President's, White House Says', *New York Times*, 24 March 1965. As implied by the Press Secretary's statement, the lack of top policy maker involvement in the decision to use irritant weapons likely reflects the greater assimilation of irritant agents in the US military at the time. On assimilation, see J.P. Robinson, 'Supply, Demand and Assimilation in Chemical-Warfare Armament' in *Military Technology, Armaments Dynamics and Disarmament: ABC Weapons, Military Use of Nuclear Energy and of Outer Space and Implications for International Law* ed. H.G. Brauch (Basingstoke: Macmillan, 1989), 112-123.

¹²⁶ FRUS, 1964-1968, Vol II, Doc. 215, 'Letter from Senator Mike Mansfield to President Johnson', 24 March 1965.

¹²⁷ Max Frankel, 'US Reveals Use of Nonlethal Gas against Vietcong', *New York Times*, 23 March 1965. See also 'Excerpts from Transcript of Rusk News Parley on Use of Gas in Vietnam', *New York Times* 25 March 1965.

The existence of the norm meant that the use of these agents might have political costs—if others thought the norm did apply—and led American policymakers to adopt various strategies aimed at lowering the costs.

One such strategy was to neutralise the language used. For example, U Alexis Johnson suggested to the Secretary of State, ‘We must also stay away from the term “chemical warfare” and any connection with the Chemical Corps, and rather talk about “weed killers”. Defense and the Chemical Corps entirely agree on this’.¹²⁸ US officials also debated the extent to which US participation in these operations, and the operations overall, should be public. One issue here was whether the planes used in anti-plant operations should carry US markings.¹²⁹

Another strategy involved an attempt to ‘domesticate’ and ‘normalise’ the use of these agents. Public statements emphasised the widespread domestic use of anti-plant and irritant agents.¹³⁰ The deliberateness of this strategy is clear in the response of the Commander in Chief, Pacific Command (CINCPAC), to General Westmoreland’s 1964 plans for the combat use of CS gas. CINCPAC made note of Westmoreland’s discussion of the possibility of an adverse reaction to the use of the gas and recommended that

If CS were first used in RVN [Republic of Vietnam] in controlling civil disturbances it might facilitate its introduction into counterinsurgency operations. GVN [the Government of Vietnam] could then adopt position that quote we use these harmless riot control weapons against our own people; it cannot be considered immoral for us to use them against our enemy unquote.¹³¹

The US sought to enhance the legitimacy of anti-plant agents in similar ways, by emphasising the domestic use of these agents and that the South Vietnamese government

¹²⁸ See the first paragraph and footnote one of FRUS, 1961-1963, Vol. I, Doc. 275, ‘Memorandum from the Secretary of State to the President’, 24 Nov. 1961.

¹²⁹ Crop destruction missions were flown under ‘Farmgate’ rules, with Vietnamese markings on the plane and a Vietnamese observer on board. See Lewy, *America in Vietnam*, 259; James R Clary, ‘Ranch Hand: Herbicide Operations in SEA’, Project CHECO Report, ADA484753 (San Francisco: Department of the Air Force, Headquarters Pacific Air Forces, 13 July 1971), 6, 11; Buckingham, *Operation Ranch Hand*, 24, 26-28, 104-5. In contrast, planes on defoliation missions carried US markings. See Buckingham, *Operation Ranch Hand*, 28.

¹³⁰ See, for example, ‘Transcript of the President’s News Conference on Foreign and Domestic Matters’, *New York Times*, 2 April 1965, when President Johnson stated ‘The type of gas that is a standard item in the South Vietnamese military forces—anti-riot item—can be purchased by an individual from open stocks in this country, just like you order something out of a Sears and Roebuck catalogue’. He went on to cite various uses that had been made of the gas in the US.

¹³¹ ‘Use of CS to Control Riots in RVN’, 1 Sept. 1964, Folder 13, Box 08, George J. Veith Collection, The Vietnam Center and Archive, Texas Tech University (accessed 15 October 2015). <http://www.vietnam.ttu.edu/virtualarchive/items.php?item=3670813012>. South Vietnamese troops did make use of tear gas in civil disturbances in November 1964, before the first use of these agents in combat. Hersh reports that the South Vietnamese were acting ‘on their own initiative’, but the September telegram from CINCPAC quoted above casts doubt on this. See Hersh, *Chemical and Biological Warfare*, 168. See also History Branch, *Command History 1964*, 96.

requested and was involved in the use of these agents. For example, there was a Vietnamese on board as the 'aircraft commander' for spray missions, although 'he exercised no real authority'.¹³²

The fact that US policy makers saw the costs associated with the norm against chemical weapons as manipulable is significant. Tannenwald argues that one form of evidence for a 'taboo explanation' is that 'the taboo could enter the decision-making process instrumentally in the form of a perceived 'cost', manifesting itself as an exogenously given constraint on decision-making'.¹³³ As I have argued, the norm against chemical weapons did influence American policy-making in this way, except that policymakers did not see the costs as exogenous. Instead, US officials saw the costs as manipulable and therefore as only partially exogenous, and this lessened the impact of the norm.

Legality

Closely related to the existence of a norm against chemical weapons is question of whether the use of anti-plant and irritant agents was legal. Rusk addressed the legality of anti-plant agents in his memo for Kennedy in November 1961. He argued that 'the use of defoliation does not violate any rule of international law concerning the conduct of chemical warfare and is an accepted tactic of war', citing a precedent of British use in Malaya.¹³⁴ William Bundy from the Department of Defense expanded on the legal argument when replying to a letter from Congressman Kastenmeier in 1963, arguing that under international law chemical warfare was limited to agents that inflict damage to the physical person of the enemy and thus did not include 'weed killers' used in both the US and Vietnam.¹³⁵

Before using irritant agents in combat, the Department of Defense asked the State Department whether such use was legal.¹³⁶ While I have not been able to find a record of the State Department response to this query, the fact that the Department of Defense continued to explore and then to use irritant agents suggests that State confirmed their legality. In 1965 an official stated that the use of these agents 'was not contrary to international law and practice', and Secretary Rusk emphasised that the Geneva Protocol did not prohibit their

¹³² Buckingham, *Operation Ranch Hand*, 36.

¹³³ Tannenwald, *Nuclear Taboo*, 51.

¹³⁴ *FRUS, 1961-1963*, Vol. 1, Doc. 275, 24 Nov. 1961.

¹³⁵ As reported by Buckingham, *Operation Ranch Hand*, 83.

¹³⁶ SIPRI, following Hersh, reports that early in 1964 the Department of Defense asked the Department of State to give a ruling on the legality of using 'nonlethal' gases in Vietnam. See SIPRI, *Rise of CB Weapons*, 185-6; Seymour M Hersh, 'Poison Gas in Vietnam', *New York Review of Books* (9 May 1968), available at: <http://www.nybooks.com/articles/archives/1968/may/09/poison-gas-in-vietnam/> (downloaded February 3, 2015).

use.¹³⁷ The Johnson administration referenced both domestic use as well as international precedents in making its case for the legitimacy of both anti-plant and irritant agents. In regard to irritant agents, Rusk emphasised that these agents 'have been used on many occasions, some in this country and on many occasions in other countries'; McNamara also cited several American domestic uses as well as use by the British in Cyprus, by West German border guards and in Canal Zone riots by Panamanian police.¹³⁸

Domestic and international critics continued to challenge the Administration's case for legality, with little effect. Once the use of anti-plant agents began in 1962, and once authority to use irritant agents in Vietnam was confirmed in the fall of 1965, issues of legality received little attention from government officials until the Nixon Administration began to consider resubmitting the Geneva Protocol to the Senate.¹³⁹

The ultimate influence of legality in the Vietnam case is unclear. Johnstone argues that because there were good arguments on both sides, 'presumably... the legal question was never the determining factor in deciding the US position. Private conversations with international legal experts both within the Department of State and outside tend to confirm this presumption'.¹⁴⁰ On the one hand, Johnstone's argument, together with the emphasis on legality in official US statements, suggests that a more explicit ban on chemical weapons, one that clearly banned the use of anti-plant and irritant agents, might have prevented use, either directly or through the generation of increased political costs. On the other hand, it is not clear the United States would have become a party to such a ban as long as it thought that these agents had military utility.¹⁴¹

Broader Laws of War

The broader laws of war were also significant. In an article on the use of chemical agents in Vietnam, Seymour Hersh quotes a statement made after World War I by the General Board of the US Navy: 'Gas warfare as practiced during the war, the Board said, violated two principles of combat which had been accepted by the civilized world for more than 100 years—that unnecessary suffering should be avoided and innocent non-combatants should

¹³⁷ See Max Frankel, 'US Reveals Use of Nonlethal Gas against Vietcong', *New York Times* 23 March 1965; 'Excerpts from Transcript of Rusk News Parley on Use of Gas in Vietnam', *New York Times* 25 March 1965; and Finney, 'Rusk Defends Use of Nonlethal Gas', *New York Times*, 25 March 1965.

¹³⁸ See 'Excerpts from Transcript of Rusk News Parley' *New York Times*, 25 March 1965 and Jack Raymond, 'Decision on Gas Not President's, White House Says', *New York Times*, 24 March 1965.

¹³⁹ When submitting the Geneva Protocol for consideration by the US Senate, Secretary of State Rogers argued, 'It is the United States understanding of the Protocol that it does not prohibit the use of riot-control agents and chemical herbicides'. See Moore, 'Ratification', 423.

¹⁴⁰ Johnstone, 'The United States Understanding of the Geneva Protocol', *DDRS*, Gale, Doc. number CK3100518058, 5.

¹⁴¹ The question of military utility and weapons bans will be developed in future work.

not be destroyed'.¹⁴² These broader norms clearly affected the US use of chemical agents in Vietnam.

For example, the principal of discrimination was an issue with the use of anti-plant agents. Critics of chemical crop destruction argued that civilians were the main victims; Congressman Richard McCarthy declared in 1970 that 'I find an anti-food campaign contrary to all principles of humanity. It has been shown time and time again that anti-food campaigns affect the soldiers of any enemy army last. The first to be affected are the old people and the children'.¹⁴³ American officials also recognised and were concerned about the possible harming of non-combatants. As discussed above, when first considering the use of anti-plant agents, Kennedy sought assurance that crop destruction operations would take place only when it was possible to distinguish between enemy and civilian crops and when programs were in place to feed any civilians affected. After he approved crop destruction operations in principle, each operation required approval from Washington. Eventually, in 1964, the American Ambassador in Saigon and the COMUSMACV received authority to approve these operations.¹⁴⁴ A complicated procedure was set up in South Vietnam to approve individual operations. This involved local Vietnamese chiefs at least in part to enable a distinction between civilian and enemy crops.¹⁴⁵ There was also a reparations system to pay for accidental damage. Of course, to the extent that these actions reassured and/or avoided harm to civilians, they also lowered the political costs of the spray operations and helped to ensure that those costs did not outweigh the military gains.

The broader laws of norms worked differently with irritant agents, justifying their use as a humane alternative when civilians were mixed with enemy combatants. For example, the JCS argued in 1965 that

Appropriate and discriminate use of riot control munitions will lead to far fewer casualties and less loss of life than would the combat alternatives...This is especially pertinent and particularly important to those cases where the Viet Cong make use of women and children as screens against our troops.¹⁴⁶

¹⁴² Hersh, *Chemical and Biological Warfare*, 211. An example of concern with harm to civilians in the war in general is a telegram from John McNaughton to Westmoreland in July 1965. See Cable, Office of Secretary of Defense to COMUSMACV, received in the White House on 9/9/65, #246a, 'Vietnam Vol. XXXVIII, Memos (B) 8/1-12/65', Country File, National Security File Box 21, LBJ Library; see also Cable, COMUSMACV to CINCPAC, Subject: Minimizing Non-Combatant Battle Casualties, received in the White House 10 Sept. 1965, #80a, 'Vietnam Vol. XL, Cables 9/1-25/65', Country File, National Security File, Box 22, LBJ Library.

¹⁴³ McCarthy, *The Ultimate Folly*, 87.

¹⁴⁴ With crop destruction, authority was delegated first for specific areas in Zone D and then later for other areas.

¹⁴⁵ The ability and/or willingness of the South Vietnamese government to make such distinctions can be questioned. Note also that US policymakers believed that South Vietnamese involvement gave the program increased legitimacy.

¹⁴⁶ Memo from Earle G. Wheeler, Chairman, Joint Chiefs of Staff to Secretary of Defense, Subject: Use of Riot Control Munitions in Vietnam (C)', JCSM-685-65, 9/11/65, #3a, 'Gas', Vol. II', National Security File, Country File, Vietnam, Box 194 LBJ Library. According to Johnstone, 'Westmoreland remarked in July 1965 that the only alternative to using tear gas to flush the enemy out of caves was

When the use of such agents became news in 1965, Secretary Rusk explained that ‘the anticipation is, of course, that these weapons be used only in those situations involving riot control or situations analogous to riot control’.¹⁴⁷ However, in contrast to the system set up for anti-plant agents, there is little to suggest that the President or the Department of Defense attempted to restrict the use of irritant agents to humanitarian purposes. In 1967, ACDA Foster endorsed a recommendation by the Legal Adviser and the Assistant Secretary of State for East Asian Affairs to ‘request the Secretary of State to impose some limitations on the use of riot-control agents in combat operations’.¹⁴⁸ I have not been able to discover if the Defense Department ever received such a request, but if so, they do not appear to have acted on it.

Indeed, as ‘Water Bucket’ makes clear, the military was interested in the use of irritant agents for a variety of purposes as early as 1964, and once Washington reaffirmed Westmoreland’s authority to use them in October 1965, there was little or no effort to monitor their use. It was not long before US forces used irritant agents in conjunction with conventional weapons to increase the lethality of attacks; as McCarthy argues, “‘Humanitarian’ use [was] forgotten in the intensity of war’.¹⁴⁹

US policymakers also asserted that both anti-plant and irritant agents were ‘safe’ and did not pose a threat to human health.¹⁵⁰ During decision-making and then publicly, US

to use napalm’. See Johnstone, ‘The United States Understanding of the Geneva Protocol’, *DDRS*, Gale, Doc. number CK3100518058, 5. The non-lethal nature of irritant agents was also argued to have military utility: one could interrogate enemy soldiers if they were captured but not if they were killed.

¹⁴⁷ Excerpts from Transcript of Rusk News Parley’ *New York Times*, 25 March 1965.

¹⁴⁸ ACDA, ‘Arms Control and Disarmament Agency’, *DDRS*, Gale, Doc. number CK3100335632, 13-14 citing Foster to Katzenbach [Under Secretary of State], Memo, 16 Oct. 1967 and Habib (State/EA) and Salans (State/L) to Katzenbach, Memo, 3 Oct. 1967. See also the memo from Katzenbach to Paul Nitze on 27 Dec. 1967 that suggests that Nitze work with Habib and Meeker of the State Department to develop rules of engagement that ‘address the use of tear gas to make other weapons more lethal’. See Air Force History Support Office, ‘Air Force History Report on Operation Tailwind’, 16 July 1998, 41-42, available at: <http://www.afhso.af.mil/shared/media/document/afd-110112-009.pdf> (downloaded 11 June 2014). A recommendation for limits was evidently incorporated into a State draft (14 Oct. 1968) of an interdepartmental NSAM on chemical and biological weapons; see ACDA, ‘Arms Control and Disarmament Agency’, *DDRS*, Gale, Doc. number CK3100335632, 16. Aldrich reports that although the State Department failed in its attempt to limit the use of irritant agents to humanitarian purposes, it was successful in prohibiting the use of DM, an irritant agent that was more lethal than CN or CS. See Aldrich, ‘Comments’, 175.

¹⁴⁹ McCarthy, *The Ultimate Folly*, 50; see also Ellison, *Chemical Warfare*, 73; Bunn, ‘Banning Poison Gas’, 256-257.

¹⁵⁰ Ecological effects were also an issue. Policy makers recognized this as a possible political cost as early as 1962, when Rachel Carson’s *The Silent Spring* was published. Individual scientists and scientific associations continued to emphasise possible ecological effects and got the issue on to the government agenda. As a result, various studies were commissioned to evaluate ecological effects. But the results of these studies were either that there would be no long-term ecological damage or that it was not yet possible to determine the ecological effects, in part because of the difficulty of conducting the necessary research in a war zone. See Zierler, *Invention of Ecocide*. For more on the role of scientists, see Sarah Bridger, *Scientists at War: The Ethics of Cold War Research* (Cambridge,

policymakers argued that the innocuous effect of both anti-plant and irritant agents was clear from the widespread domestic use of these agents. However, this concern with safety was largely superficial. Policy makers did not undertake any serious effort to examine whether the use of these agents domestically and in Vietnam was really equivalent in terms of the likely effects.¹⁵¹

In retrospect, these assertions of safety seem cynical if not downright duplicitous. US forces used irritant agents to force people from tunnels or shelters in Vietnam, and it was known that they were more likely to be lethal in such closed conditions. The domestic use of anti-plant agents also differed significantly from their use in Vietnam, in terms of the quantity of agent sprayed, the quantity of land sprayed, and the intended effects, and by July 1969, the US had sprayed more than ten percent of South Vietnam with herbicides.¹⁵² However, this was not necessarily duplicitous. Recent work arguing for the importance of context in interpreting the legality of the use of particular weapons suggests that at the time of the Vietnam War the accepted approach to the legality of weapons was to think in dichotomous terms (legal or illegal, safe or unsafe), instead of thinking in terms of gradations or context.¹⁵³

Moreover, when a study was published that suggested that Agent Orange (2,4,5-T) caused malformed babies and stillbirths in mice when administered in relatively high doses, policy did change.¹⁵⁴ In November 1969, Deputy Secretary of Defense Packard restricted the use of Agent Orange in Vietnam to areas remote from populations (the use of other anti-

MA: Harvard UP, 2015); Dael Wolfe, *Renewing a Scientific Society: The American Association of the Advancement of Science from World War II to 1970* (Washington DC: AAAS, 1989).

¹⁵¹ Wil D. Verwey, *Riot Control and Herbicides in War* (Leyden: A.W. Sijthoff, 1977), 13-15, 48-49.

¹⁵² Johnstone, 'The United States Understanding of the Geneva Protocol', *DDRS*, Gale, Doc. number CK3100518058, 7. The formulation of Agent Orange also differed from its domestic formula. See Institute of Medicine, *Veterans and Agent Orange*, 1994, 91, citing Alvin L Young et al., 'The Toxicology, Environmental Fate, and Human Risk of Herbicide Orange and its Associated Dioxin', USAF OEHL Technical report TR-78-92 (Brooks Air Force Base, TX: USAF Occupational and Environmental Health Laboratory, October 1978). See SIPRI, *Rise of CB Weapons*, 166-177 for figures on the use of anti-plant agents in Vietnam; see also Young et al., 'The Toxicology, Environmental Fate, and Human Risk of Herbicide Orange', 18-113.

¹⁵³ James D Fry, 'Contextualized Legal Reviews for the Methods and Means of Warfare: Cave Combat and International Humanitarian Law', *Columbia Journal of Transnational Law* 44/2 (2006), 453-519. Martini makes a related point when he argues the effect of herbicides on human health was not a salient issue for decision makers in the Kennedy Administration; 'Like nearly every American citizen in the early 1960s, Rusk, Hilsman, McNamara, and Kennedy believed herbicides to be safe for human contact. There is simply no evidence to the contrary'. See Edwin A Martini, *Agent Orange: History, Science and the Politics of Uncertainty* (Amherst, MA: University of Massachusetts Press, 2012), 241, see also 240-242. Note that according to Martini the chemical companies knew much more.

¹⁵⁴ The key report was Bionetics Research Laboratories, *Evaluation of Carcinogenic, Teratogenic and Mutagenic Activities of Selected Pesticides and Industrial Chemicals* (1968). The story of who knew what, and when, about the health effects of Agent Orange is controversial, with some authors suggesting that US officials deliberately covered-up the Bionetics study. See Aaron Wildavsky with Brendon Swedlow, 'Dioxin, Agent Orange and Times Beach' in *But is it True? A Citizen's Guide to Environmental Health and Safety Issues* (Cambridge: Harvard UP, 1997), 81-125; see also Zierler, *Invention of Ecocide*, esp. 122-124; Lewy, *America in Vietnam*, 263; Martini, *Agent Orange*, 100, 240-241; Buckingham, *Operation Ranch Hand*, 163-164.

plant agents continued as normal).¹⁵⁵ Then in April 1970, the Department of Defense suspended the use of Agent Orange completely, despite protests from the military, when three Federal agencies decided to impose new limits on its use in the United States.¹⁵⁶ By Rusk's own definition, if Agent Orange was harmful to humans its use should be classed as chemical warfare and the United States claimed to abide by the norm against it; such harm also violated wider laws of war against unnecessary suffering, proportionality, and discrimination.¹⁵⁷

The influence of 'safety' in the Vietnam case is suggestive. While the presumption in US policy-making on anti-plants agents was that they were safe, the fact that the norm against chemical weapons and the broader laws of war were understood to establish a principle that chemicals should not be used to kill humans and especially non-combatants in war provided a base on which to argue against the use of these agents.¹⁵⁸ However, the case for the use of anti-plant agents rested perhaps to a unique degree on the argument that they did not harm humans, for both Kennedy's initial decision to authorise use and the public case for use rested upon their safety. More typically, for irritant agents, the claim was that they were 'more humane' than the alternatives. This suggests that there is more work to do on the interaction between the norm against chemical weapons, the broader laws of war, and the material characteristics of weapons.

In the same way, the domestic use of both anti-plant and irritant agents meant that these agents were part of a technological system where the use of these agents were seen as safe and useful; it also meant there were vested interests in the continued use of these weapons. This made it more difficult to challenge their use in Vietnam. Moreover, as we have seen, it was not until the use of Agent Orange was limited domestically that it was banned in Vietnam.

¹⁵⁵ Buckingham, *Operation Ranch Hand*, 163; he suggests that Packard's order did not have much affect because a similar request had been made by South Vietnamese President Thieu in 1968. Professor Matthew Meselson reports that the girlfriend of one of his students, who worked for Nader's Raiders, brought him a copy of the Bionetics report. He took it to the President's Science advisory, Lee DuBridge, who then called David Packard, Deputy Secretary of Defense. According to Meselson, the use of Agent Orange was restricted the same day. (Matthew Meselson, Interview, 1 September 2015).

¹⁵⁶ See the discussion in Buckingham, *Operation Ranch Hand*, 166-167 (including footnote *). A variety of factors contributed to this decision. See Clary, *Ranch Hand*, 30; Cecil, *Herbicide Warfare*, 150, see also 210, footnote 43. While these other factors are all important, the importance of safety is emphasised by fact that the first limits on herbicide use were on the use of Agent Orange.

¹⁵⁷ The use of other anti-plant agents continued, although it was curtailed as the Nixon Administration faced increasing protests over the War and implemented its policy of Vietnamization. The last US aerial defoliation mission took place on 9 May 1970 and all US crop destruction operations were terminated on 16 January 1971. See Buckingham, *Operation Ranch Hand*, 167 and 175. Note that the use of anti-plant agents by Vietnamese Air Force crews continued into 1972. Young, *History, Use, Disposition*, 122.

¹⁵⁸ See Tannenwald, *Nuclear Taboo*, 52 for a discussion of the 'burden of proof' as a measure of normative effects.

Conclusion

This article has investigated the role that military utility and normative factors played in US decisions regarding the use of anti-plant and irritant agents in the Vietnam War. I have shown that US policy makers used a consequentialist logic in their decisions, weighing the costs of use against the benefits. There was little evidence of the use of an appropriateness logic; there is no example of a US policy maker who argued that the US should not use these weapons because any chemical weapon was somehow antithetical to the US's self-conception. Instead, US decision makers conveniently designated anti-plant and irritant agents as falling outside the category of prohibited chemical weapons.

In the calculation of costs versus benefits, US policymakers treated military utility as the most important issue. They generally argued that if these weapons had military utility, then they should be used. In this sense, considerations of military utility was determinative. This is not to say that normative factors had no influence. Normative factors featured largely instrumentally, as a possible generator of political costs that were included in the consequentialist logic. Normative factors thus made the use of these weapons more difficult, with potential political costs 'raising the bar' that had to be met in order for them to be used. They also led policy makers to devise strategies to lessen potential political costs, including oversight and restrictions on the use of anti-plant agents. Norms surrounding chemical weapons also influenced the process of decision-making, and in particular, they raised the issue of weapons use from a purely military decision to one that involved top policy makers, including the President. However, pressure on US decision makers to use any tool that might contribute to victory in South Vietnam meant that normative factors were not decisive. This pressure seems to have led to a presumption of military utility; those who argued *against* the use of weapon had to meet an increased burden of proof.

I demonstrated that three types of military utility received attention—technical, tactical, and strategic. US policy makers treated technical utility as an absolute—as something a weapon did or did not have—at least within a specific context. The case study also shows that military utility is difficult to assess and that there is room to contest it. In particular, it demonstrates that tactical effectiveness was debated and socially negotiated. Within those negotiations, the military played a special role as the presumptive authority on military utility. The role of the military as the arbiter of military utility, together with the fact of domestic use and the need to bring all possible advantages to bear in Vietnam, made it more difficult to oppose the use of these agents once their technical utility was established. With anti-plant agents, publication of a finding that Agent Orange was harmful to human health was

necessary before its use was restricted, while the US military used irritant agents until the end of the war.

This case is also suggestive of other factors that influenced US policy. One is the possible impact of organisational interests. The available documents do not allow a clear determination of who first suggested the use of irritant agents in Vietnam or how irritant agents came to be included in Military Assistance Programs.¹⁵⁹ There is thus more work to do on the role of various individuals and institutions involved in the American CBW program and the role they played in US decisions to use anti-plant and irritant agents in Vietnam.

The Vietnam War is generally seen as a turning point in the role of the media in war.¹⁶⁰ While space constraints prevented me from developing this, it is clear from the documentary record that American policy makers were sensitive to media coverage of the use of anti-plant and irritant agents. Future research might explore the extent to which media coverage served as a channel through which normative concerns influence policymaking.¹⁶¹

Similarly, the role of popular protest deserves more attention than I was able to give it here. While I have suggested above that the finding that Agent Orange was harmful to human health was a key factor in the decision to restrict the use of anti-plant agents in Vietnam, that decision took place within a broader context. That broader context included the Tet Offensive and the increasing hollow nature of assurances that the US could win the war, Vietnamisation of the war effort, and increased public protests against the war.¹⁶² While the continued use of irritant agents (as well as napalm, which was the most controversial) suggests that this broader context was not directly responsible for the restrictions on the use of Agent Orange and other herbicides, it is likely that it facilitated those restrictions.

There is also more work to do on the role of norms. It is possible that the modest impact of norms in decisions about the use of anti-plant and irritant agents in Vietnam is due to the fact that the war came in an early part of the 'life cycle' of the norm against chemical weapons. If this is the case, we would expect to see more appropriateness-type reasoning as the norm develops.¹⁶³ Realists would expect that military pressures would continue to constrain policy makers to give greater consideration to military utility than political costs, even in the face of a developed norm against weapons use.

¹⁵⁹ Jacobsen states that William Godel of ARPA was 'the architect of...the Agent Orange defoliation campaign'. Jacobsen, *The Pentagon's Brain*, 180, see also 126-128.

¹⁶⁰ See, for example, William M Hammond, *Public Affairs: The Military and the Media, 1962-1968* (Washington DC: Center of Military History, US Army, 1990). While this is not a focus of my research, it is clear that early on American decision makers thought that public opinion about the war was something that they could manipulate; my sense is that this belief was eroded over time.

¹⁶¹ I thank an anonymous reviewer for suggesting this point.

¹⁶² Zierler argues that the Nixon administration's strategy of détente was an important part of the context as well. See Zierler, *Invention of Ecocide*, 138ff.

¹⁶³ See Finnemore and Sikkink, 'International Norm Dynamics'.

A related question concerns the role of the Vietnam War in the further development of international norms, including norms against chemical and biological weapons as well as environmental modification techniques.¹⁶⁴ For example, the Senate Foreign Relations Committee held the Geneva Protocol hostage to a change in US policy on anti-plant and irritant agents, refusing to ratify the treaty unless the Nixon and then the Ford Administration made such changes. The agreement eventually reached with the Ford Administration produced Executive Order 11850, 'Renunciation of Certain Uses in War of Chemical Herbicides and Riot Control Agents'.¹⁶⁵

The analysis here suggests that other normative factors, including legal prohibitions and the broader laws of war, also influence state decisions regarding the use of particular weapons. To the extent that international treaties formalised normative concerns, they were an explicit constraint on US policy; they necessitated a judgement about legality. This meant that US policy makers had to consider and make an explicit decision about use, and so prevented use following inevitably from the availability of these agents.¹⁶⁶ While this constraint is valuable in providing an opportunity to scrutinise the necessity of use, some analysts at the time suggested that since legal arguments could be made both for and against the legality of these agents, legality did not provide a strong constraint.¹⁶⁷ And again, both social and material factors are important: With the broader laws of war that focus on harm to non-combatants, the material characteristics of weapons are key, as these help to determine a weapon's potential for discriminate use as well as its lethality.¹⁶⁸

There is also more work to be done on norms and utility in the Vietnam War. In future work I will extend this analysis to examine US policy-making on the use of biological, nuclear, and lethal chemical weapons in Vietnam. The non-use of these weapons and the

¹⁶⁴ I thank an anonymous reviewer for encouraging me to make this point. For an analysis of the Vietnam War and its impact on thinking regarding the relationship between war and the environment, see Zierler, *Invention of Ecocide*. Jacobsen suggests there were other spin-offs; that the Vietnam War and the protests against it led to an acceleration of research into non-lethal weapons. See Jacobsen, *Pentagon's Brain*, 217-221; see also Crowley, *Chemical Control*.

¹⁶⁵ The text of the executive order is available at <http://www.archives.gov/federal-register/codification/executive-order/11850.html> (accessed 25 March 2016). Note that this Order has not been the last word on the large-scale use of herbicides or the use of irritant agents in war. See, for example, Martin Jelsma, 'Vicious Circle: The Chemical and Biological "War on Drugs"', Transnational Institute (March 2001), available at: <https://www.tni.org/files/download/viciouscircle-e.pdf>; William Neuman, 'Defying US, Colombia Halts Aerial Spraying of Crops Used to Make Cocaine', *New York Times*, 14 May 2015; on arguments for the use of irritant agents by US forces in war since Vietnam, see Crowley, *Chemical Control*.

¹⁶⁶ I thank an anonymous reviewer for highlighting this role of legal norms.

¹⁶⁷ The work on the targeting of civilians in war also casts doubt on the constraining power of international law in time of war. See Valentino et al., 'Covenants without the Sword'; Downes, *Targeting Civilians*; see also Krasner, *Sovereignty*, for a more general dismissal of the power of international principles to constrain states.

¹⁶⁸ Of course, social construction can still play a role in determining what level of harm to civilians is acceptable or indeed in the construction of the categories of combatant and non-combatant.

recognition of a norm against their use make this an important comparison for the work undertaken here.¹⁶⁹

Overall, this case study demonstrates that, although both norms and military utility influenced US decisions about chemical use and non-use in Vietnam, those decisions were based largely -- as structural realists expect -- by a concern with military effectiveness.

¹⁶⁹ I will also examine the non-use of nuclear weapons.

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